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THE ^{Annual}
SEVENTY-FIRST REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL & LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION, 1890-91.

READ AT THE ANNUAL MEETING, MAY 5th, 1891.

Leeds:

PRINTED BY MCCORQUODALE & CO. LIMITED.

1891.

THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY consists of the following Classes of Members and Subscribers :—

- (1.) ORIGINAL PROPRIETARY MEMBERS (holding £100 Shares), who are entitled to personal admission to the Museum, Library, Lectures, and all other Meetings of the Society, and to two transferable tickets to admit visitors to the Lectures. They are exempt from Annual Subscription.
- (2.) NEW PROPRIETARY MEMBERS (holding £50 Shares), who are entitled to similar personal privileges, and to two transferable tickets. Subscription, £1 1s. per annum.
- (3.) ORIGINAL ORDINARY MEMBERS (holding £3 3s. Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £2 2s. per annum.
- (4.) NEW ORDINARY MEMBERS (holding £20 Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £1 1s. per annum.

The following are entitled to personal admission to the Museum, Library, and Lectures, but not to business meetings; nor have they any transferable tickets to admit visitors :—

- (5.) HONORARY MEMBERS, elected on the recommendation of the Council.
- (6.) SUBSCRIBERS of £1 1s. per annum.
- (7.) SUBSCRIBERS of 7s. 6d. per annum, being Ladies or Young Persons resident with Members, or with Subscribers in Class (6).

A list of shares from time to time offered for sale by Members is kept in the office, and information as to price, &c., may be obtained from the Secretary.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members, voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

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REPORT OF THE COUNCIL

AT THE CLOSE OF THE

SEVENTY-FIRST SESSION.

The most memorable of the local scientific events of the year was the meeting in Leeds, for the second time, of the British Association for the Advancement of Science. The Council of the Philosophical and Literary Society, which joined in the invitation to the Association, had much pleasure in placing its rooms at the disposal of the Local Committee for the preliminary business meetings, and in giving the use of their Hall and Library for the use of Section B (Chemistry) during the Association week. The Council were pleased to receive the assurance that the arrangements then made had been highly appreciated, and they have to acknowledge with thanks the consideration of the Local Executive Committee in voting that the balance remaining in their hands after paying the expenses of the meeting should be handed to this Society. The amount thus received was £21 os. 5d.

Another satisfactory circumstance is the gradual diminution of the debt originally incurred by the installation of the electric light for Lecture Hall purposes in 1886. This debt, which at the date of the Annual Meeting in 1888 amounted to £469, has been reduced in the three succeeding years to the respective amounts of £227, £169, and (at the present time) £87. It is gratifying to observe that in the last two years this result has been produced without resort to any

unusual methods of increasing the income of the year, but rather by curtailing expenses so far as could be done without diminishing the efficiency of the various departments of the Society's work.

In this connection the Council have to acknowledge with gratitude the help which has been given by the gentlemen who have generously given their lectures to the Society. During the Session just ended the Council have had to thank the following for such favours: Sir Henry Doulton, Prof. Stroud, Mr. Douglas Freshfield, the Bishop of Ripon, Bishop Barry, the President of the Society (Mr. T. Pridgin Teale), Mr. Common, and Prof. Thorpe.

The Lecture Session was of more than average interest and importance, and the General Meetings of the Society were well attended. The Syllabus of Lectures was as follows :—

1. "Some Modern Developments of English Pottery," illustrated by a valuable collection of artistic pottery, and by practical demonstrations of the artist's skill with the Potter's Wheel. By Sir Henry Doulton, on the *21st Oct.*, 1890.
2. "The effect produced by the Musical Revolution of 1600 upon Choral Music," with vocal illustrations by a select choir, kindly prepared for the occasion by Mr. Alfred Broughton, of Leeds. By C. H. H. Parry, Mus. Doc. *Nov. 4th*, 1890.
3. "Range-finders, Past and Present," with an exhibition of various instruments. By Prof. W. Stroud, D.Sc. *Nov. 18th*, 1890.
4. "The Caucasus," with lantern illustrations. By W. Douglas Freshfield, M.A., F.R.G.S. *Dec. 2nd*, 1890.
5. "The Great Seals of England and their History," with lantern and other illustrations. By Allan Wyon, F.S.A. *Dec. 16th*, 1890.
6. "Iceland." By Prof. James Bryce, D.C.L., M.P. *Jan. 20th*, 1891.

7. "The Mediæval Monastery as the Home of Art and Culture," with lantern illustrations. By Prof. G. Baldwin Brown, M.A. *Feb. 3rd*, 1891.
8. "Leaves from the Book of the Great Decease; the last days of Gotama." By the Lord Bishop of Ripon. *Feb. 10th*, 1891.
9. "Law and Liberty; a Present Day Problem." By Bishop Barry, D.D. *Feb. 24th*, 1891.
10. "Dust and Fresh Air: how to keep out the one and let in the other," with lantern and other illustrations. By the President (T. Pridgin Teale, M.A., F.R.S.). *March 3rd*, 1891.
11. "Recent Astronomical Work," with lantern illustrations and exhibition of astronomical instruments. By A. A. Common, F.R.S. *March 17th*, 1891.
12. "Some Recent Contributions to Terrestrial Magnetism," with illustrations by the lantern and scientific instruments. By Prof. T. E. Thorpe, Ph.D., F.R.S. *April 7th*, 1891.

In addition to the regular lectures, the Society was favoured with an address on the Greek inscriptions in its Museum, by the Rev. Canon Hicks, M.A., on Saturday afternoon, December 13th, 1890. The address was replete with information given in a very attractive way, and was calculated to arouse an intelligent interest in the monuments possessed by the Society as well as in the subject of epigraphy in general.

The chief drawback to an otherwise gratifying survey of the year is a decrease in the number of our Members and Subscribers, the following being a comparison with the previous year, viz. :—

	1890.	1891
Original Proprietary Members (78 shares) ...	70	70
New Proprietary Members (121 shares) ...	94	94
Ordinary Members	2	2
New Ordinary Members	77	78
Annual Subscribers of £1 1s. ...	163	137
Annual Subscribers of 7s. 6d. ...	168	143
Total	574	524

The most extensive work undertaken in the Museum during the past year has been the cleaning and re-labelling of the entire collection displayed in the Large Zoological Room. A series of small maps has been coloured to show the distribution of each family of the Mammalia. Two upright cases in this room have been appropriated for a collection of the smaller British Mammals.

The Birds have also received considerable attention. A new series has been added to illustrate the differences in plumage consequent on sex, and another to exhibit some typical examples of the change in plumage which birds undergo at different seasons of the year. It was mentioned in the last Annual Report that Mr. Waite had presented a number of British Birds' Nests to the Museum. So many additions have been made during the past year that it has become necessary to have a new case made for their reception. This has been placed, together with the previously existing one, in the Gallery of the Ornithological Room.

The British Marine Shells have been entirely remounted. Each species is now placed in a separate glass-covered box, in which form the land and fresh-water types are also displayed. In addition to the Marine Shells possessed by the Society, the Conchological Society has deposited a fine series, which adds much to the value of the collection.

The collection of Insects displayed in the South Room has been almost completed, and it is hoped that the two remaining cases, one to illustrate Insect Constructions, and the other Transformations of Insects, will be dealt with during the present year. The Economic Collection of Insects has been

enriched, and 20 very instructive cases are now exhibited. The large series of British and Foreign Galls, presented some years ago by the late Mr. Wilson Armistead, has been remounted, and is now displayed in three large cases among the Insect collections.

The rearing of Lepidoptera, which has been carried on for some years past, and which receives considerable attention from visitors, was exhibited once more last season when no less than 25 species were shown, a larger number than has ever been reared before.

In two table cases in the Large Zoological Room a new series is exhibited, to illustrate the methods of attack and defence practised by animals.

The cataloguing of the contents of the Museum has again been taken in hand, and considerable progress has been made. The principal work done in this department during the past year has been the cataloguing of the entire Ethnological Collections. The fossils are now receiving attention.

The most important donation to the Museum during the year has been a Roman Altar, which was dredged up in 1890 at Woodnook, near Castleford, and presented by the Aire and Calder Navigation Company. This interesting local antiquity has been placed in a case in the vestibule of the Hall. The inscription, which is rather defaced in the bottom line, reads as follows:—

DEAE · VIC
TORIAE ·
BRIGANT ·
A · D · AURS
FA[?]ORIANU

The Greek inscriptions presented many years ago by the Very Rev. John Gott, now Dean of Worcester, and formerly Vicar of Leeds, have been re-described by the Rev. Canon Hicks, of Manchester, in the *Journal of Hellenic Studies*, Vol. XI. (1890). Seven hundred and fifty copies of this important memoir, which is illustrated by a photograph and woodcuts, have been purchased from the publishers for the use of the Society.

The number of visitors to the Museum during the year was 28,636, being an increase of 1,339 over the previous year.

Last May an interesting collection of Postage Stamps, to commemorate the Jubilee of Penny Postage in England, was made by Messrs. Roebuck, Skipwith, and others, and was exhibited for a fortnight in the Society's Museum. The Exhibition was in every way successful, and reflected great credit on the gentlemen who organised it.

With deep regret the Council have to record the loss of an esteemed friend and colleague by the death of Mr. Charles Pebody. Mr. Pebody early adopted literature as his profession, and attained great skill as a reporter. Developing his interest in journalism he occupied the post of editor to various daily newspapers, notably at Exeter and Bristol, removing from the last-named city to Leeds in 1882 to assume the editorship of the "*Yorkshire Post*," which had been vacated by the late Mr. J. Ralph. Mr. Pebody had much flexibility of style, vivacious humour, and excellent business capacity. His knowledge of public men was very extensive, and he was able on various occasions materially to serve the Leeds Philosophical and Literary Society by using his influence to obtain lectures which without it could hardly have been secured. He pub-

lished "English Journalism, and the Men who have made it," and "Authors at Work," besides writing extensively for magazines. Mr. Pebody died October 30th, 1890, after an illness which commenced suddenly about two months previously. Aged 51 years.

From the list of Honorary Members of the Society two names have been lost by death during the year, viz.: those of the Archbishop of York and Dr. H. B. Brady, F.R.S., &c.

The Archbishop of York (the Right Hon. and Most Reverend William Thomson, D.D., Primate of England) was born at Whitehaven in 1819, and educated at Shrewsbury School, proceeding at the age of seventeen years to Queen's College, Oxford, in due course becoming a Scholar and Fellow. He was ordained in 1842, but after a few years of parochial work returned to his College, where he successively filled the offices of Dean, Bursar, and Provost. Dr. Thomson's influence was cast in favour of the movement, culminating in the University Reform Act of 1854, and he earnestly supported the liberalising changes in the constitution of Queen's College, which were one of the consequences of this alteration of the law. Through the successive steps of the Preachership of Lincoln's Inn and the short tenure of ten months of the Bishopric of Gloucester and Bristol, Dr. Thomson reached at the early age of 43 the Archbishopric of York, and he held this commanding position for no less than 28 years. Dr. Thomson was a deep thinker and had the advantage over men of narrower training in possessing a broad scientific knowledge. He was a Fellow of the Royal Society, of the Chemical Society, of the Royal Geographical Society, and other learned bodies.

His Grace conferred upon the Leeds Philosophical and Literary Society the favour of delivering the Inaugural Address of the Session of 1877-8, when a very large audience gathered in the Victoria Hall, which had been specially secured for the occasion. The address was subsequently published by the Society, its title being "The Worth of Life." The pessimist doctrines propounded by Schopenhauer and others were combatted in the address with masterly skill. It was upon the same day as that upon which the Archbishop delivered this address that he laid the foundation-stone of the buildings of the Yorkshire College. The question of a new University for the north of England was then pending, and his Grace gave expression to his desire for such a federation of Colleges as was afterwards adopted as the basis of the Victoria University. The Archbishop was created a Member of the Court of the University by nomination in its Charter. He died at the Palace, Bishopthorpe, December 25th, 1890, aged 71 years.

Henry Bowman Brady, LL.D., F.R.S., F.L.S., &c., was the second son of a surgeon at Gateshead-upon-Tyne. He became associated with Leeds in 1850, when he was articled as a pupil to the late Mr. Thomas Harvey, pharmaceutical chemist. He brought from Newcastle-upon-Tyne a strong bias for natural history, derived from such naturalists as Alder, Albany, John Hancock, and others, and found youthful associates in Leeds having similar tastes. Photography was in its infancy at that time, and presented great attractions to these young students, who achieved much success in the new art. In 1855 Mr. Brady entered upon business as a pharmaceutical chemist at Newcastle, and continued this for twenty-one years, devoting much time, however, to the service of the Pharmaceutical

Society, both as an Examiner and Member of Council. He was the first Treasurer, and for two years President of the British Pharmaceutical Conference. Mr. Brady selected Foraminifera as his special branch of natural history, and published various monographs on Carboniferous and Permian Foraminifera, and on Parkeria and Loftusia. His *magnum opus* was the Report on Foraminifera, forming Part xxii. of the Zoological Series of Reports on the Scientific Results of the Voyage of H.M.S. *Challenger*. The illustrations of this and his other works owed much to the personal skill as a draughtsman possessed by the author. Mr. Brady devoted the leisure of the last fifteen years to the pursuits of natural history, and to extensive travel. Although his health was so delicate that he rarely ventured to winter in England, his energy was marvellous, and he visited Morocco, the United States, China, Japan, India, Borneo, and various Pacific Islands. He gave to the Leeds Philosophical and Literary Society, in its Session 1878-9, the results of his visit to Morocco, in a paper entitled "Morocco and the Moors." In 1888, the University of Aberdeen conferred upon Mr. Brady the honorary degree of LL.D., and in the same year he was placed upon the Council of the Royal Society. He died at Bournemouth, January 10th, 1891, aged 56 years.

*Summary of Meteorological Observations taken at the Philosophical Hall,
Leeds, during the year 1890.*

1890.	Mean Temperature.	Mean Height of Barometer.	Total Amount of Rain in inches.	
			Museum.	Woodhouse Cliff.
January	42°3	29°649	3°28	3°15
February	38°6	30°078	°69	°93
March	43°9	29°600	1°66	1°87
April	43°6	29°661	°85	1°04
May	53°8	29°694	2°62	2°50
June	56°9	29°771	1°55	2°05
July... ..	57°8	29°682	2°94	2°12
August	56°7	29°668	3°94	4°18
September	59°0	29°926	1°69	1°91
October	50°0	29°856	°70	°83
November	42°6	29°678	2°31	2°82
December	33°2	29°905	°79	1°12

Mean monthly temperature—48°2.

Mean monthly height of the barometer—29°764 inches.

Total rainfall for the year—Museum 23°02 inches; Woodhouse Cliff 25°12 inches.
Average rainfall at the Museum for the ten years 1881-1890—24°58 inches.

Greatest degree of heat, indicated by the thermometer in the shade—79° on September 8th; minimum—18° on December 22nd.

Greatest barometric pressure—30°588 inches on February 23rd, the temperature of the mercury being 47°; least pressure—28°518 inches on January 23rd, the temperature of the mercury being 56°.

Greatest fall of rain (during 24 hours)—°90 inches on August 11th.

Latitude, 53° 48' 20" N.; longitude, 1° 33' W. Height of the cistern of the barometer above the level of the sea, 137 feet; height of the rain gauge above the street, 46 feet.

SUNSHINE AT LEEDS IN 1890.

The observations were made by Jordan's Photographic Sunshine Recorder, at the following stations:—

1. The Museum, situate in the centre of the town; elevation above the sea, 137 feet.
2. Woodhouse Cliff, $1\frac{1}{2}$ miles N.W. from the centre of the town; elevation, 330 feet; residential suburb.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the town; elevation, 475 feet; on the fringe of the borough.
4. Union Infirmary, Burmantofts, 1 mile from the centre of the town; elevation, 200 feet; industrial district.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible duration.
JANUARY	1	17'0	6'6
	2	29'6	11'4
	3	37'1	14'3
	4	26'8	10'3
FEBRUARY	1	13'4	4'8
	2	25'0	9'0
	3	37'6	13'5
	4	30'7	11'0
MARCH.. . . .	1	64'4	17'6
	2	87'0	23'7
	3	93'2	25'4
	4	90'9	24'8
APRIL	1	77'7	18'7
	2	116'9	28'2
	3	135'0	32'7
	4	118'7	28'6
MAY	1	147'0	30'6
	2	170'3	37'2
	3	188'4	39'1
	4	180'2	37'4
JUNE	1	74'2	15'0
	2	100'9	20'4
	3	96'8	19'6
	4	109'1	22'0
JULY	1	116'8	25'1
	2	154'4	31'1
	3	156'2	31'4
	4	139'2	28'0
AUGUST	1	125'9	28'0
	2	159'1	35'4
	3	163'6	36'5
	4	146'7	32'7
SEPTEMBER	1	107'3	28'5
	2	132'8	35'2
	3	148'7	39'5
	4	129'5	34'4
OCTOBER	1	75'0	22'8
	2	98'7	30'0
	3	113'2	34'4
	4	100'5	30'6
NOVEMBER	1	30'1	11'4
	2	41'0	15'5
	3	51'3	19'4
	4	34'5	13'0
DECEMBER	1	1'7	0'6
	2	4'1	1'7
	3	8'2	3'4
	4	3'2	1'3

SUMMARY FOR THE YEAR.

Museum	19'1	per cent. of possible duration.
Woodhouse Cliff .. .	25'3	" " "
Lawnswood	27'6	" " "
Burmantofts	25'6	" " "

24'4	per cent. mean for 1890.
20'7	" " 1889.
19'9	" " 1888.
28'0	" " 1887.

The Meteorological Office publishes the following records of Sunshine in 1890, as observed at stations taken as representing specified districts:—

	Percentage of possible duration.	Difference from mean.
Scotland, N. (Stornoway)	23	—4
" E. (Aberdeen, Braemar, Marchmont)	28	—4
" W. (Glasgow, Douglas, Isle of Man)	29	—1
England, N.E. (Durham, York)	28	—1
" N.W. (Penrith, Stonyhurst, Blackpool, Llandudno)	28	—2
" Mid. (Bawtry, Leicester, Oxford, &c.)	31	0
" S. (London, Hastings, Southampton, &c.)	33	0
" E. (Hillington, Geldestone, Ingatstone)	35	0
" S.W. (Pembroke, Falmouth, Plymouth, &c.)	34	—2
Ireland, N. (Armagh, Markree Castle)	28	0
" S. (Dublin, Parsonstown, Valencia)	31	—2
Channel Islands (Jersey)	41	—2

SUMMARY.

30'7 per cent. mean for United Kingdom, 1890.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Payments for the Year 1890-91.

RECEIPTS.				PAYMENTS.			
	£	s.	d.		£	s.	d.
To Balance in hand, May 1st, 1890	...	...	0 8 7	By Balance Due to Bank, May 1st, 1890	...	...	168 12 3
" Annual Subscriptions, viz. :—				" Repairs and Alterations	...	23 15 4	
80 New Proprietary Members, at 21s.	...	84	0 0	" Rates and Taxes	...	4 8 8	
1 Original Ordinary do.	42s.	2 2 0		" Fire Insurance...	...	13 15 0	
65 New Ordinary do.	21s.	68 5 0		" Coals, &c.	...	32 14 11	
130 Annual Subscribers, at 21s.	...	136 10 0		" Gas	...	21 19 6	
144 Annual Subscribers, at 7s. 6d.	...	54 0 0		" Cleaning	...	5 16 9	
" Arrears ...	...	11 11 0		" Salaries...	...	308 0 0	102 10 2
" Rent, viz. :—			356 8 0	" Fee to Auditor...	...	2 2 0	
Cellars	...	40 0 0		" Collections, viz. :—			310 2 0
Lecture Room	...	208 6 6		Archæological	...	4 14 6	
" Receipts from Visitors to Museum	...	...	248 6 6	Zoological	...	43 5 5	
" Sale of Guides	...	4 2 0	119 6 4	Library	...	22 19 10	
" Sundries	...	3 4 3		Scientific Apparatus	...	13 7 10	
" Donation British Association Local Committee	...	...	7 6 3	" Postages	...	8 0 2	84 7 7
" Balance Due to Bank...	...	...	21 0 5	" Advertising and Printing	...	38 15 9	
			87 7 4	" Lectures	...	80 2 6	
				" Interest and Bank Commission	...	8 13 0	
				" Sundries	...	15 4 9	150 16 2
				" Electric Lighting	...	...	22 9 4
				" Balance in Hand	...	...	1 5 11
							£840 3 5

I have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.
May 23^d, 1891.
 CHAS. BEEVERS,
 CHARTERED ACCOUNTANT.

LIST OF DONATIONS AND ADDITIONS
TO THE
SOCIETY'S MUSEUM AND LIBRARY.
1890-91.

ZOOLOGY.

Long-eared Bat	Mr. J. J. Brigg, Keighley.
Merlin	Dr. J. E. Eddison.
Albatross	Mr. John Harrison, Leeds.
Egg of Currasow	Miss Nussey, Roundhay.
Nests of British Birds	Mr. Edgar R. Waite.
Ditto	{ Mr. Riley Fortune, Harrogate.
Nest of Oven Bird	Mr. Thos. Bunker, Goole.
Jaws of Shark	Mr. J. E. Glover, Leeds.
Marine Shells	Mr. J. W. Dixon, Leeds.
Living Pupæ of <i>T. prometheus</i>	Mr. James Pickles, Leeds.
Nest of Wasp.....	Mrs. J. E. Eddison.

GEOLOGY.

Oolitic Brachiopoda	{ Mr. J. F. Walker, M.A., F.G.S., York.
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ARCHÆOLOGY AND ETHNOLOGY, &c.

Roman Altar dredged at Woodnook, near Castleford	{ Aire and Calder Navigation Co.
Roman Altar	Rev. R. R. Kirby.
Indian Chegal (Water-skin)	{ Mr. T. S. Kennedy, Wetherby.
French Passport, 1835	Mr. J. D. Bell, Leeds.

PUBLICATIONS.

- | | | |
|---|---|--|
| Catalogue of Fossil Reptilia and Amphibia, Part IV. | } | British Museum. |
| Catalogue of Birds, Vols. XIII., XV., and XVIII..... | | |
| Guide to Galleries of Geology and Palæontology, Parts I. and II. ... | | |
| Catalogue of Fossil Fishes, Part II. | | |
| Catalogue of Fossil Cephalopoda, Part II. | | |
| Catalogue of Lizards, Vol. III. | | |
| Guide to the Natural History Department, Science and Art Museum, Dublin. No. 1, Vertebrate Animals | } | The Department. |
| | | |
| British Fossil Vertebrata, by A. S. Woodward, F.G.S., and C. D. Sherborn, F.G.S. Supplement for 1890 | } | Purchased. |
| | | |
| Note on a Fossil Fish (<i>Cottus fasciatus</i>) and Marine Worm (<i>Nereis</i> sp.) from Ottawa, by Sir Wm. Dawson, LL.D., F.R.S. | } | The Author. |
| | | |
| Bibliography of the Muskogean and Iroquoian Languages, by James C. Pilling | } | Smithsonian Institution. |
| Problem of the Mounds, and the Circular, Square, and Octagonal Earthworks of Ohio, by Cyrus Thomas | | |
| Textile Fabrics of Ancient Peru, by Wm. H. Holmes | | |
| | | |
| List of Plants in the Sheffield Public Museum | } | The Museum. |
| | | |
| "Wattles and Wattle-Barks," by J. H. Maiden, F.L.S., F.C.S. | } | Department of Public Instruction, N.S.W. |
| | | |
| Two Beverley Churches, by William Stephenson, M.R.C.S., and John Bilson, A.R.I.B.A..... | } | The Authors. |
| | | |

Description of Four New Species of Terrestrial Mollusca from S. Africa, by J. C. Mellvill, M.A., F.L.S., and John Hy. Ponsonby, F.Z.S.	} The Authors.
Dictionary of the Language of the Micmac Indians, by Rev. Silas T. Rand, D.D., LL.D.	
Handbook for Leeds and Airedale British Association Meeting, 1890	} The Local Committee.
Fauna der Gaskohle, by Dr. A. Fritsch, Band III., Heft. I.	
Decimal Coinage, &c., by Sir G. Molesworth, K.C.I.E.	} Decimal Association.
The Great Trigonometrical Survey of India, Vols. XI., XII., and XIII.	
	} Secretary of State in Council of India.

PERIODICALS.

WEEKLY.

Nature	Purchased.
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BI-WEEKLY.

Atti della R. Accademia dei Lincei...	} The Academy.
Bollettino delle Publicationi Italiane, 1890-91	
	} The Compiler.

MONTHLY.

Annals and Magazine of Natural History	} Purchased.
Geological Magazine	
Journal of the Chemical Society	} The Society.
Monthly Notices of the Royal Astro- nomical Society	
Philosophical Magazine and Journal of Science	} Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical Society.....	} The Society.
Proceedings of the Zoological Society	
	} The Society.

QUARTERLY.

Quarterly Journal of Microscopical Science	} Purchased.
Quarterly Journal of Geological Society	The Society.
Quarterly Returns of Marriages, Births, and Deaths	} Registrar-General.
Journal of the Royal Historical and Archæological Association of Ireland	} The Association.
Journal of the Anthropological Institute	} The Institute.
Zeitschrift für Wissenschaftliche Zoologie.....	} Purchased.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions	Purchased.
Proceedings of the Royal Society ...	The Society.
Proceedings of the Royal Society of Edinburgh, Vols. XV., 1887-8, and XVI., 1888-9	} The Society.
Transactions do. do.	
Vol. XXXV., Parts III., 1887-8, and IV., 1889-90	
Proceedings of the Royal Institution of Great Britain, Vol. XIII., Part I., 1891	} The Institution.
Transactions of the Royal Irish Academy, Vol. XXIX., Parts XIII., XIV., and XV., 1890-91	} The Academy.
Proceedings do. do.	
Vol. I., Nos. III. and IV., 1890-91	
Royal Irish Academy, "Cunningham Memoirs," No. V., "The Red Stars"	} The Society.
Scientific Proceedings of the Royal Dublin Society, Vol. VI., Parts VII., VIII., and IX., 1889-90	
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THE
SEVENTY-SECOND REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1891-2.

READ AT THE ANNUAL MEETING, MAY 3rd, 1892.

LEEDS:
JOWETT & SOWRY, PRINTERS, 73, ALBION STREET.
—
1892.

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A list of shares from time to time offered for sale by Members is kept in the office, and information as to price, &c., may be obtained from the Secretary.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds: and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members, voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE CLOSE OF THE

SEVENTY-SECOND SESSION.

The Seventy-second Session of the Society was opened on October 27th by a *Conversazione*, at which nearly four hundred Members, Subscribers, and Guests were present. In addition to numerous objects of interest from our own collections, by the kindness of Col. Harding, Mr. A. S. Dixon, Dr. Eagland, Mr. W. H. Flower, Mr. J. Broadhead, Mr. E. J. Dodgshun, Messrs. Cassell & Co., Mr. R. Atkinson, and other gentlemen, a large number of Paintings, Original Etchings, and Drawings for book illustration were exhibited. Mr. H. Bendelack Hewetson showed some beautiful specimens of Egyptian Embroidery and Pottery, and Mr. George Bell his unique collection of Portraits of Yorkshire Worthies. Collections of Shells were exhibited by the Conchological Society and Mr. J. W. Taylor, and many interesting Microscopic Objects by local naturalists.

The General Meetings of the Society were well attended, and the Lectures of very varied interest. The thanks of the Society are due to Professor L. C. Miall, F.G.S., F.L.S., Mr. W. Hancock, F.L.S., F.R.G.S., Professor T. Clifford Allbutt, M.D., F.R.S., and Dr. Albert W. Schüddekopf, who gave their services gratuitously. The Syllabus of Lectures was as follows:—

- 1.—“Some difficulties in the Life of Aquatic Insects.” By Prof. L. C. MIALL, F.L.S., F.G.S. *Nov. 3rd, 1891.*
- 2.—“An Astronomer’s Thoughts about Krakatoa.” With lantern illustrations. By Sir ROBERT S. BALL, LL.D., F.R.S. *Nov. 17th, 1891.*

- 3.—“The Strength and Weakness of England as a Great Power.” By Colonel J. F. MAURICE, R.A., Professor of Military History at the Staff College. *Dec. 1st, 1891.*
- 4.—“Formosa: its geology, flora, fauna, and aborigines, &c.” By W. HANCOCK, F.L.S., F.R.G.S., of the Chinese Imperial Customs Service. *Dec. 15th, 1891.*
- 5.—“The Troubadours.” By Rev. P. H. WICKSTEED, M.A. *Jan. 5th, 1892.*
- 6.—“The Travels of Early Peoples: Trade and War Routes.” By Dr. T. CLIFFORD ALLBUTT, F.R.S. *Jan. 19th, 1892.*
- 7.—“Henrik Ibsen.” By EDMUND GOSSE, M.A. *Feb. 2nd, 1892.*
- 8.—“Recent Contributions to our knowledge of the Production and Consumption of Alcohol.” With lantern illustrations. By Prof. PERCY F. FRANKLAND, Ph.D., B.Sc., F.R.S. *Feb. 16th, 1892.*
- 9.—“Exploration among the Ruined Cities of Mashonaland.” By J. THEODORE BENT, M.A. *March 1st, 1892.*
- 10.—“The Evolution of Modern Photography.” By Prof. R. MELDOLA, F.R.S. *March 15th, 1892.*
- 11.—“The History of the Faust Legend.” By ALBERT W. SCHÜDDEKOPF, Ph.D. *April 5th, 1892.*

The number of Members and Subscribers is as follows:—

	1891	1892
Original Proprietary Members (78 shares) ...	70	71
New Proprietary Members (121 shares) ...	94	94
Ordinary Members	2	2
New Ordinary Members	78	77
Annual Subscribers of £1 1s.	137	126
Annual Subscribers of 7s. 6d.	143	129
Total	524	499

27,168 visitors have paid for admission to the Museum.

Considerable progress has been made with the manuscript catalogues of the Museum, and that of the Geological collection, containing upwards of 3,000 entries, representing many times this number of specimens, has been completed. A valuable

series of permanent photographs of sections of the coal-measures under Leeds has been presented by Mr. F. W. Branson. They are suitably framed, and accompanied by the necessary geological information. This collection is of great and lasting interest, especially as the sections from which the photographs were taken are no longer visible.

A collection of British birds' eggs, to replace those stolen or wilfully destroyed some years ago, has been presented to the Society by the Curator (Mr. E. R. Waite), and by the liberality of the Mayor of Leeds (Ald. Wm. Boothroyd), a considerable number of less common specimens has been added.

In the Invertebrate collections, a case illustrating the transformations of insects has been prepared, and another is in progress to exemplify the powers of construction by which they provide for their own safety or capture their prey.

Many species of Lepidoptera have been reared during the season, and special attention has been paid to the hatching of trout-ova. The young trout were kept alive until the yolk-sac was absorbed. Much interest has been taken by visitors in both these novel exhibits.

Miss Robson has presented a valuable portrait by Schwanfelder of the Rev. Richard Winter Hamilton, LL.D., D.D., who for upwards of twenty years, until his untimely death in 1848, took a very active interest in the affairs of the Society. He was President in 1836-7-8, and contributed eighteen papers to its proceedings.

At the Annual Meeting in 1891, Mr. Richard Reynolds, F.C.S., F.I.C., resigned the position of Honorary Secretary, which he had held to the great advantage of the Society for twenty-two years, though he consented to continue his valuable assistance as a Member of the Council. The services which Mr.

Reynolds has rendered to the Society by his unwearying attention to its business, his unfailing tact, and his sound judgment, will be long remembered by his colleagues and the public.

In October, 1891, Professor L. C. Miall, F.L.S., F.G.S., owing to the pressure of other duties, placed his resignation in the hands of the Council. Professor Miall was appointed to the Curatorship of the Society in April, 1871, and in the course of twenty years has raised our collection to a high position among provincial Museums. As a small token of their appreciation of his long and invaluable services to the Society, a few friends presented Professor Miall with an Original Proprietary Share and a Zeiss Microscope. The Council were then enabled to elect Professor Miall one of the Honorary Curators in Zoology.

Mr. Edgar R. Waite, F.L.S., has been appointed Curator of the Museum.

*Summary of Meteorological Observations taken at the Philosophical Hall,
Leeds, during the year 1891.*

1891.	Mean Temperature.	Mean Height of Barometer (inches).	Total Amount of Rain in inches.	
			Museum.	Woodhouse Cliff.
January	36·4	29·896	1·32	1·37
February	39·8	30·252	·03	·07
March	39·0	29·630	·96	1·17
April	42·2	29·829	1·66	1·85
May	48·9	29·605	2·08	2·17
June... ..	58·1	29·781	·91	1·08
July	58·2	29·720	2·42	3·33
August	57·2	29·564	3·65	3·82
September	57·6	29·754	1·48	1·60
October	49·1	29·529	3·63	4·00
November	42·4	29·640	2·88	3·11
December	38·6	29·682	4·10	4·44

Mean monthly temperature—47·3°.

Mean monthly height of the barometer—29·740 inches.

Total rainfall for the year—Museum 25·12 inches; Woodhouse Cliff 28·01 inches.
Average rainfall at the Museum for the ten years 1882-1891—24·24 inches.

Greatest degree of heat, indicated by the thermometer in the shade—82° on September 10th; minimum—13° on January 19th.

Greatest barometric pressure—30·582 inches on October 31st, the temperature of the mercury being 42°; least pressure—28·332 inches on November 11th, the temperature of the mercury being 49°.

Greatest fall of rain (during 24 hours)—·83 inches on October 14th.

Latitude, 53° 48' 20" N.; longitude, 1° 33' W. Height of the cistern of the barometer above the level of the sea, 137 feet; height of the rain gauge above the street, 46 feet.

SUNSHINE AT LEEDS IN 1891.

The observations were made by Jordan's Photographic Sunshine Recorder at the following stations:—

1. The Museum, situate in the centre of the town; elevation above the sea, 137 feet.
2. Woodhouse Cliff, $1\frac{1}{2}$ miles N.W. from the centre of the town; elevation, 330 feet; residential suburb.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the town; elevation, 475 feet; on the fringe of the borough.
4. Union Infirmary, Burmantofts, 1 mile from the centre of the town; elevation, 200 feet; industrial district.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible duration
JANUARY	1	18'7	7'2
	2	36'4	14'0
	3	45'3	17'5
	4	24'3	9'4
FEBRUARY	1	22'0	7'9
	2	34'6	12'5
	3	63'2	22'7
	4	35'2	12'7
MARCH	1	91'3	24'9
	2	102'0	27'8
	3	102'5	27'9
	4	106'1	28'9
APRIL	1	59'3	14'3
	2	89'8	21'6
	3	99'4	23'9
	4	92'2	22'2
MAY	1	119'7	24'8
	2	140'1	39'1
	3	150'2	31'2
	4	132'8	27'5
JUNE	1	124'8	25'2
	2	155'2	31'4
	3	168'4	34'0
	4	148'0	29'9
JULY	1	128'7	25'9
	2	153'6	30'9
	3	165'0	33'2
	4	139'8	28'1
AUGUST	1	62'2	13'9
	2	79'2	17'6
	3	94'3	21'0
	4	86'1	19'2
SEPTEMBER	1	106'2	28'2
	2	117'2	31'1
	3	133'7	35'5
	4	120'9	32'1
OCTOBER	1	57'6	17'5
	2	75'1	22'8
	3	92'4	28'1
	4	73'6	22'4
NOVEMBER	1	8'1	3'1
	2	12'2	4'6
	3	26'0	9'8
	4	15'8	6'0
DECEMBER	1	12'1	5'0
	2	6'7	2'8
	3	23'0	9'5
	4	8'5	3'5

SUMMARY FOR THE YEAR.

Museum	18'2	per cent. of possible duration.
Woodhouse Cliff	22'5	" " "
Lawnswood	26'1	" " "
Burmantofts	22'1	" " "
<hr/>		
	23'2	per cent. mean for 1891.
	24'4	" " 1890.
	20'7	" " 1889.
	19'9	" " 1888.
	28'0	" " 1887.
	23'0	" " five years.

The Meteorological Office publishes the following record of sunshine in 1891, as observed at stations taken as representing specified districts:—

	Percentage of possible duration.	Difference from mean.
Scotland, N. (Stornoway, &c.)	26.	0
" E. (Aberdeen, Marchmont)	30	—1
" W. (Glasgow, Douglas, Isle of Man)	31	+1
England, N.E. (Durham, York)	28	0
" N.W. (Stonyhurst, Blackpool, Llandudno)	28	—2
" Mid. (Cirencester, Oxford, &c.)	31	0
" S. (London, Hastings, Southampton, &c.)	36	+3
" E. (Hillington, Geldestone, Cambridge)	33	—1
" S.W. (Pembroke, Falmouth, Plymouth, &c.)	37	+1
Ireland, N. (Armagh, Markree Castle)	31	+3
" S. (Dublin, Parsonstown, Valencia)	34	+1
Channel Islands (Jersey)	40	+3

SUMMARY.

32'6	per cent. mean for United Kingdom, 1891.
30'7	" " 1890.
29'2	" " 1889.
27'5	" " 1888.
35'6	" " 1887.
31'1	" " five years.

Statement of Receipts and Payments for the year 1891-2.

I have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.

May 28th, 1892.

CHAS. BEEVERS,
CHARTERED ACCOUNTANT.

CHARTERED ACCOUNTANT.

LIST OF DONATIONS AND ADDITIONS
TO THE
SOCIETY'S MUSEUM AND LIBRARY.
1891-2.

ZOOLOGY.

Capercaillie (<i>Tetroa urogallus</i>)	{ Mr. William Harrison, Wilstrop.
British Birds' Eggs	Ald. Boothroyd, Mayor.
Ditto	The Curator.
Nest of Baltimore Oriole (<i>Icterus baltimore</i>)	{ Mr. James Wickson, Clayton West.
Chamæleon (<i>Chamæleon vulgaris</i>).....	{ Mrs. F. Hatchard, Ponte- fract.
New Zealand Swift (<i>Hepialus virescens</i>) {	Hon. & Rev. J. W. Lascelles, Goldsborough.

ETHNOLOGY.

Batanga Canoe (West Africa) deposited by Commander John Denison, R.N. }	Per Mr. Armitage Ledgard, Scarcroft.
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Portrait of the late Dr. Richard Winter } Hamilton, by Schwanfelder	Miss Robson, Scaggle- thorpe, Malton.
Six Photographs, in 2 frames, to illustrate the Geology of the Leeds Coal Measures	{ Mr. F. W. Branson, Leeds.

PUBLICATIONS.

Catalogue of British Oligocene and Eocene Mollusca	{ British Museum.
Catalogue of Birds, Vols. XIX. and XX.	
Catalogue of Fossil Birds	
Catalogue of Lepidoptera Heterocera, Part VIII.	

Portæ Magiæ Naturalis, D.D. LXXXVIII.}	Rev. C. Hargrove, M.A.
Yorkshire County Magazine, Parts I.-X., 1891	J. Horsfall Turner (Editor).
Zoological Record, 1888 to date	Deposited by the Yorkshire Naturalists' Union.
Time Reckoning for the 20th Century, Sanford Fleming, C.M.G., C.E.	Smithsonian Institution.
Omaha and Pouka Letters, J. O. Dorsey	
Catalogue of Prehistoric Works, East of the Rocky Mountains, Cyrus Thomas.....	
Claus und die Entwicklung der Scyp- homedusen. A. Goette	
North American Fauna, No. 5	The Author.
"Our Trees," John Robinson	U.S. Department of Agri- culture.
Observations on the Temperature of the Nidd, March, 1889, to July, 1891. Geo. Paul, F.R.Met.S.....	Essex Institute, U.S.A.
New South Wales and other Minerals (No. 6), A. Liversidge, M.A., F.R.S.}	The Author.
Scientific Correspondence of Joseph Priestley, Hy. C. Bolton, 1892 ...}	Purchased.
The Great Trigonometrical Survey of India, Vol. XIV.}	Secretary of State in Council of India.

PERIODICALS.

WEEKLY.

Nature Purchased.

BI-WEEKLY.

Bollettino delle Publicationi Italiane, }
1891-2 } The Compiler.

MONTHLY.

Annals and Magazine of Natural }
History } Purchased.

Geological Magazine Purchased.

Journal of the Chemical Society	The Society.
Monthly Notices of the Royal Astro- nomical Society	The Society.
Philosophical Magazine and Journal of Science	
	Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical Society	The Society.
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QUARTERLY.

Quarterly Journal of Microscopical Science	Purchased.
Quarterly Journal of Geological Society	The Society.
Quarterly Returns of Marriages, Births, and Deaths.....	Registrar-General.
Journal of the Anthropological Institute	The Institute.
Zeitschrift für Wissenschaftliche Zoo- logie	Purchased.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions.....	Purchased.
Proceedings of the Royal Society ...	The Society.
Proceedings of the Royal Society of Edinburgh, Vol. XVII., 1889-90 ...	The Society.
Transactions do. do.	
Vol. XXXIV., 1890, and XXXVI., Part I., 1889-90	
Proceedings of the Royal Institution of Great Britain, Vol. XIII., Part II., 1892	The Institution.
Transactions of the Royal Irish Academy, Vol. XXIX., Parts XVI. and XVII., 1891	The Academy.
Proceedings do. do.	
Vol. I., No. V., and Vol. II., No. I., 1891	

Scientific Proceedings of the Royal Dublin Society, Vol. VI., Part X, 1890, and Vol. VII., Parts I. and II., 1891	} The Society.
Scientific Transactions do. Vol. IV., Parts VI., VII., and VIII., 1890-91	
Journal and Proceedings of the Royal Society of New South Wales, Vol. XXIV., Part II., 1890	} The Society.
Publications of the Royal Swedish Academy of Sciences	} The Academy.
Papers of the Royal University of Norway	} The University.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Förhand- linger, Heft III., 1890, and I. and II., 1891	} Royal Danish Society of Sciences.
Papers and Proceedings of the Royal Society of Tasmania, 1890	} The Society.
Proceedings and Transactions of the Royal Society of Canada, Vol. VIII., 1890	} The Society.
Proceedings of the Royal Society of Queensland	} The Society.
Annual Report of the Royal Cornwall Polytechnic Society, 1890	} The Society.
Journal and Annual Report of the Royal Institution of Cornwall	} The Institution.
Bulletin Société Impériale, Moscow ...	The Society.
“Leopoldina” Amtliches organ der Kaiserlichen, Leopoldino-Carolini- schen Deutschen Akademie der Naturforscher, 1890	} The Academy.
British Association Reports, 1890 and 1891	
Australasian Association Report	The Association.

Reports of the Smithsonian Institution, 1888 and 1889	} The Institution.
Smithsonian Miscellaneous Collections	
Smithsonian Contributions	
Miscellaneous Publications of the Bureau of Ethnology, 1889-91	
Transactions of the Academy of Science of St. Louis	} The Academy.
Transactions and Proceedings of the New Zealand Institute, Vol. XXIII., 1890	
Annual Report, Middlesex Hospital...	} The Institute.
Annual Report of the Trustees of the Cooper Union for the Advancement of Science, 1890	
Victorian Year-Book, Vol. I., 1890-91. By Henry Heylyn Hayter, C.M.G.)	} The Hospital.
Bulletin of the Essex Institute, U.S.A., Vols. XXI. and XXII., 1889-90 ...)	
Proceedings of the Birmingham Philo- sophical Society	} The Author
Annual Report of the Yorkshire Philosophical Society, 1890	
Proceedings of the Glasgow Philo- sophical Society, Vol. XXII., 1890-91)	} The Institute
Transactions of the American Philo- sophical Society	
Proceedings do. Vol. XXIX., Nos. 135 and 136, 1891	} The Society.
Report of the Halifax Literary and Philosophical Society	
Transactions of the Leicester Literary and Philosophical Society, Vol. II., Parts VII.—IX.)	} The Society.
Report of the Committee of Leicester Town Museum	
Annual Report of the Brighton Town Museum, 1890-91.....)	} The Museum.

Annual Report of the Birkenhead Literary and Scientific Society, 1890-91	The Society.
Memoirs and Proceedings of the Man- chester Literary and Philosophical Society, 4th Series, Vol. IV. (Parts IV. and V.), 1890-91	The Society.
Proceedings of the Liverpool Literary and Philosophical Society	The Society.
Annual Report and Proceedings of the Liverpool Science Students' Association	The Association.
Annual Report of the Sheffield Literary and Philosophical Society, 1890 and 1891	The Society.
Annual Report and Transactions of the Hull Literary and Philosophical Society	The Society.
Report of the President of Yale University	The University.
Catalogue ditto. 1891-2	
Proceedings of the Canadian Institute	The Institute.
Annual Report do. 1890	
Transactions do. Vol. I., Part II., 1890-91, and Vol. II., Part I., 1891	
Proceedings and Transactions of the Nova Scotian Institute of Natural Science, Vol. VII., Part IV., 1889-90	
Proceedings of the Academy of Natural Sciences of Philadelphia, Parts I., II., and III., 1891	The Academy.
Papers do. do.	
Proceedings of the American Academy of Arts and Sciences, New Series, Vol. XVII., 1889-90	The Academy.
Annual Report of the Chester Society of Natural Science and Literature, 1890-91	The Society.

Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	} The Academy.
Memoirs of the National Academy of Sciences, Washington.....	} The Academy.
Proceedings of the Davenport Academy of Natural Science.....	} The Academy.
Transactions of the Wagner Free Institute of Science, Philadelphia ...	} The Institute.
Annual Report, Transactions, and Miscellaneous Papers of the Historical and Scientific Society of Manitoba, 1890	} The Society.
Memoires de la Société d'émulation d'Abbeville	} The Society.
Journal of the Elisha Mitchell Scientific Society, Vol. VIII., Part I.	} The Society.
Journal and Proceedings of the Hamilton Association, Part VII., 1890-91	} The Association.
Memorias de la Sociedad Científica (Mexico), Tomo IV., Num 11 and 12, 1891, and V., 1—4, 1891-2	} The Society.
Greenwich Observations.....	The Astronomer-Royal.
Transactions of the Astronomical Observatory of Yale University ...	} The University.
Annual Report do. 1890-91	}
Memoirs of the Royal Astronomical Society	} The Society.
Anuario del Observations Astronomico Nacional, Mexico, 1891	} The Astronomer.
Boletin del Observatorio Astronomico Nacional de Tacubaya, Tomo I., Num 5, 6, 7, and 8	} The Observer.
"Boletín Mensual" Observatorio Meteorologico-Magnetico, Central de Mexico, Tomo III., Num 1, 2, and 3, 1890	} The Editor.

Cape Meridian Observations	Cape Astronomer-Royal.
Radcliffe Astronomical and Meteorological Observations	Radcliffe Trustees.
Symons's British Rainfall, 1890	Purchased.
Monographs of the Palæontographical Society, Vol. XLV., 1891	Purchased.
Proceedings of the Geologists' Association, Vol. XI., Part IX., 1890, and I.—VII., 1891	The Association.
Journal of the Royal Geological Society of Ireland	The Society.
Proceedings of the Liverpool Geological Society, Vol. VI., Part III., 1890-91	The Society.
Journal of the Liverpool Geological Association, Vol. XI., 1890-91	The Association.
Transactions of the Manchester Geological Society, Vol. XXI., Parts 7—13, 1891	The Society.
Transactions of the Leeds Geological Association, Part VI., 1890	The Association.
Transactions of the Edinburgh Geological Society, Vol. VI., Part III., 1890-91	The Society.
Records of the Geological Survey of N.S.W., Vol. II., Parts III. and IV., 1891	The Surveyor.
Memoirs of the Geological Survey of N.S.W., Palæontology, Nos. 5 and 8 (Part 2), 1891	
Annual Report and Papers of the Department of Mines, N.S.W., 1890	The Department.
United States Geological Survey, 10th Annual Report, 1888-9	The Department.
Geological and Natural History Survey of Canada	
Annual Report and Papers—do. Vol. IV., 1888-9	Department of the Interior.
Contributions to Canadian Palæontology, 1891	

Geological Record	Purchased.
Transactions and Proceedings of the Royal Geographical Society of Australasia (N.S.W. Branch).....	The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club, 1890-91	
Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne.....	The Tyneside Naturalists' Field Club.
Proceedings of the Berwickshire Naturalists' Club, 1887-89	The Club.
Proceedings of the Boston Society of Natural History, U.S.A., Vol. XXV., Parts I. and II., 1890-91 ...	
Memoirs do.	The Society.
Transactions of the Leeds Naturalists' Club and Scientific Association, Vols. I. and II.....	
Bulletin of United States National Museum, Nos. 41 and 42	The Museum.
Proceedings do. Vol. XIII., 1890...	
Report do. 1888...	
Records of the Australian Museum, Vol. I., Nos. 6-10, 1891	The Trustees.
Report of the Trustees of the Austra- lian Museum, 1890	
Report of the Manchester Museum, Owens College.....	The Curator.
Prodromus of the Zoology of Victoria	The Editor.
Publications of the Ray Society, Vol. IV., Part I., 1890.....	Purchased.
Annual Report of the Curator of the Museum of Comparative Anatomy, Harvard College, 1890-91	
Annual Report of Harvard College, 1890-91	The College.
Harvard University Catalogue	The University.

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| Mittheilungen der Kais. Königl. Geo-
graphischen Gesellschaft in Wien,
Band XXXIII., 1890, and XXXIV.,
1891 | } The Society. |
| Report of Associated Architectural
Societies, Vol. XX., Part II., 1890 | |
| Journal of the Chester Archaeological
and Historic Society, Vol. III., 1890 | |
| Report of the Muséum National,
Rio-de-Janeiro..... | |
| Archivos ditto..... | } Directeur Général. |

LIST OF OFFICERS AND COUNCIL,

1892-3.

OFFICERS.

PRESIDENT	REV. J. H. D. MATTHEWS, M.A.
VICE-PRESIDENTS.	{ T. PRIDGIN TEALE, M.A., F.R.S. REV. CHAS. HARGROVE, M.A.
HONORARY SECRETARIES	{ SYDNEY LUPTON, M.A. ARTHUR SMITHELLS, B.Sc.
TREASURER	JAMES W. OXLEY.
HONORARY CURATOR IN GEOLOGY	{ J. A. NUNNELEY, M.B.
HONORARY CURATORS IN ZOOLOGY	{ EDWARD ATKINSON, F.L.S. LOUIS C. MIALI F.L.S., F.R.S.
HONORARY CURATOR IN ETHNOLOGY AND WORKS OF ART	{ J. E. EDDISON, M.D.
HONORARY LIBRARIAN	REV. CHAS. HARGROVE, M.A.

The above officers, with the following gentlemen, form the

COUNCIL.

TALBOT BAINES, B.A.	RICHARD REYNOLDS, F.I.C.
WM. WOODHAM BEST, M.A.	THOMAS SCATTERGOOD.
NATHAN BODINGTON, M.A.	J. H. WICKSTEED, M.Inst.C.E.
T. WALTER HARDING.	J. J. WILLSON.
THOMAS MARSHALL, M.A.	EDMUND WILSON.

Secretary	W. F. HUSBAND, LL.B.
Curator	EDGAR R. WATTE, F.L.S.

LIST OF MEMBERS AND SUBSCRIBERS,

1892-3.

** Members deceased, whose shares have not been transferred.*

PROPRIETARY MEMBERS,

EXEMPT FROM ANNUAL SUBSCRIPTIONS.

2	*Aldam, Wm.	.	
3	Armitage, Robert	.	Farnley.
4	Arthington, Robert	.	Headingley.
5	Baines, Herbert S.	.	Cawood, Apperley Bridge.
63	Barr, Frederick Horatio	.	North Grange Road, Headingley.
6	Barran, John, M.P.	.	Chapel-Allerton Hall.
20	Battye, John	.	Birstal.
22, 24	*Beckett, W., M.P. (2 shares)	.	
18	Bilbrough, Alfred	.	15, Beech Grove Terrace.
8	Binks, Benj., Junr.	.	5, Park Place.
45	Braithwaite, James, M.D.	.	Clarendon Road.
9	Broadhead, Wm. Henry	.	7, St. Margaret's Terrace, Ilkley.
11	*Brown, James	.	
31, 62	*Brown, S. J. (2 shares)	.	
13, 14	Calverley, Edmd. (2 shares)	.	Oulton Hall.
15	Charlesworth, C. H.	.	Settle.
16	Chorley, Mrs.	.	9, Cavendish Road.
19	Close, James William	.	32, Park Row.
21	Cudworth, John W.	.	43, Mount Preston.
23	Dibb, Mrs. Elizabeth	.	
25	Eddison, John Edwin, M.D.	.	6, Park Square.
26	*Ellershaw, John	.	
28	Empson, Christopher	.	Beechwood, Sowerby Bridge.
29, 48	Ford, J. R. (2 shares)	.	Quarry Dene, Weetwood.

- 33 Goodman, Benjamin . Gledhow House.
- 36-8 Gott, Wm. Henry (3 shares) Armley House.
- 61 Greenhow, Wm. T. . Newton Cottage, Chapel-Allerton.
- 44 Greenwood, Arthur . 8, Cavendish Road.
- 39 Harding, T. R. . St. Ann's Tower, Headingley.
- 64 Harding, Thomas Walter . Tower Works, Globe Road.
- 41 Heaps, Charles Denison . Avenue House, Woodhouse Lane.
- 40 Heaps, John William . Park View Villas, Cowper Street.
- 42 Heaton, Beresford R. . Claremont, Leeds.
- 30 Horsfall, J., M.A., F.R.C.S. Merivale Lodge, Meyrick Road,
Bournemouth, E.
- 47 Ingham, Constantine . 5, Blenheim Terrace.
- 49 Jowitt, Mrs. John . Harehills, Potternewton.
- 51 Kinnear, Thos. John, M.A. The Abbey, Malton.
- 55 Luccock, Mrs. . Beech Holme, Burley, Leeds.
- 32 Lupton, Edward Basil . Moorlands, Headingley.
- 57 Lupton, Mrs. F. . Beechwood, Roundhay.
- 53 Lupton, Francis M., M.A. Rockland, Newton Park.
- 56 Lupton, Sydney, M.A. . Grove Cottage, Roundhay.
- 58 *Makins, Charles .
- 77 Marsh, John Jenks . Cressy House, Woodsley Road.
- 59 Marshall, Arthur, F.G.S. . 13, Belsize Avenue, London, N.W.
- 60 Marshall, John, M.A. . Derwent Island, Keswick.
- 66 Marshall, Reginald Dykes The Cottage, Keswick.
- 67 Marshall, V. A. E., B.A. . Monk Coniston, Ambleside.
- 50 Mason, Charles Letch . Moorland Terrace.
- 65 Miall, Prof. Louis C. . 5, Montpellier Terrace.
- 43 *Nelson, George Hird .
- 7 North, John . North Hill, Roundhay.
- 68 Nunneley, J. A., M.B. . 22, Park Place.
- 46 Raynar, Joseph Percival . Moorfield Lodge, Headingley.
- 69 Rhodes, John . Potternewton House.
- 70 *Shepherd, John .
- 10 Streatfeild, Richard James. The Rocks, Uckfield, Sussex.
- 71 Tatham, George . Springfield Mount.

- 52 Taylor, Benjamin . 20, Moorland Road.
 72 Teale, Thomas Greenwood Bentley House, Meanwood.
 73 *Teale, Mrs. .
 74 Tottie, Mrs. John William The Grange, Bedale.
 34. 35 Truro, the Bishop of (2 shares) The Palace, Truro.
 54 Waite, James Butler . Belvidere, Newton Road.
 75 Walker, Edward . 32, Springfield Mount.
 17 Walker, Reginald Thomas 1, Furnival's Inn, Holborn,
 London, E.C.
 76 *Ward, William Sykes .
 12 Wilson, Rev. Benjamin . Christ Church Vicarage, Mirfield.
 78 Wilson, Edmund . Denison Hall.
 27 Wood, Robert Henry . 15, Bainbrigge Road, Headingley.
 1 Wurtzburg, John Henry . 2, De Grey Road.

NEW PROPRIETARY MEMBERS,

WITH AN ANNUAL SUBSCRIPTION OF ONE GUINEA.

- 32 Atkinson, Edward, F.L.S. . 16, Blenheim Terrace.
 113 Bailes, Richard . Ridge Villa, Meanwood Road.
 116 Baines, Frederick . Weetwood Lodge.
 2 Balme, E. B. Wheatley, M.A. Cote Wall, Mirfield.
 62 Barley, D. H., M.D. . Grove House, Burmantofts.
 91 Bedford, James . Woodhouse Cliff.
 15 Bilbrough, Wm. Radford . 15, Beech Grove Terrace.
 3 Birchall, Edward . Inglemoor House, Moorland Rd.
 121 Blackburn, Henry G. . 31, Park Row.
 13 Boothman, David . Rough House, Headingley.
 4 Boothroyd, William . Grove Mill, Headingley.
 10 Bowling, John . Newstead House, Spencer Place.
 33-4. 84 *Brown, S. J. (3 shares) (P) .
 5, 6 Brown, G. W. (2 shares) . Heathfield, Ilkley.
 89 Buckton, Joshua . Meanwood.
 1 Burrell, Benjamin A. . 5, Mount Preston.

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| 86 | Carter, J. B. | . | Elm House, Potternewton. |
| 9 | *Chadwick, William | . | |
| 14 | Conyers, W. H. | . | The Hills, Ilkley. |
| 45 | Craven, John | . | 3, Beech Grove Terrace. |
| 98 | Craven, Joseph | . | 1, Beech Grove Terrace. |
| 104 | Crawford, John William | . | Newton Lane. |
| 26 | Dawson, Thomas | . | Caledonian House, Caledonian Road. |
| 19 | Fairbairn, Sir Andrew | . | Askham Grange, near York. |
| 118 | Flitch, John R. | . | Chapel-Allerton. |
| 52 | Fraser, Mrs. James B. | . | Claremont, Horsforth. |
| 102-3 | Gott, William Henry (P)
(9 shares) | . | Armley House. |
| 106-10 | | | |
| 114-15 | | | |
| 22 | Hargrave, Charles | . | St. Agnesgate House, Ripon. |
| 23 | *Hargrave, James | . | |
| 7 | Hargrove, Rev. C., M.A. | . | De Grey Terrace. |
| 16 | Harvey, William | . | Heathfield, Ilkley. |
| 81 | Hatch, S. C. | . | Clyde House, Westcombe Park Road, Blackheath, London. |
| 44 | Hepper, Mrs. J. H. | . | Suffolk Lodge, Harrogate. |
| 51 | Hoggard, Alfred | . | 25, Cavendish Road. |
| 36 | *Hudson, Henry | . | |
| 120 | Ingham, Samuel | . | Headingley Hall. |
| 96 | Jepson, Edward George | . | 20, Springfield Mount. |
| 39 | Jowitt, Robert Benson | . | Elmhurst, Harehills, Leeds. |
| 40 | Joy, Alfred Lomas | . | Headingley. |
| 43 | *Kitson, James | . | |
| 46 | Kitson, J. Hawthorn | . | Elmete Hall, Roundhay. |
| 47 | Kitson, Sir James, Bart. | . | Gledhow Hall. |
| 48 | Kitson, Mrs. F. W. | . | Burley Hill, Leeds. |
| 90 | Lawson, Frederick W. | . | Woodfield, Wood Lane. |
| 50 | Leather, Ernest Arthur | . | Birstwith Hall, Harrogate. |
| 53 | Lupton, Mrs. Arthur | . | Headingley. |
| 95 | Lupton, Arthur G. | . | Wellington Street. |

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| 21 | Lupton, Edgar | . Moorlands, Headingley. |
| 8 | Lupton, Henry | . Lyndhurst, Headingley. |
| 54 | Lupton, Joseph | . The Elms, Chapel-Allerton. |
| 55 | Lupton, John | . Moorlands, Headingley. |
| 56 | Lupton, William Walter | . The Grove, Roundhay. |
| 63, 99, 100 | Lupton, Fras. Martineau,
M.A. (P) (3 shares) | . Rockland, Newton Park. |
| 88 | McGuire, Thomas | . Grosvenor Villa, Grosvenor Rd. |
| 94 | Malcolm, John Cooper | . Brighton Villa, New Leeds. |
| 25 | Marsden, Mrs. H. R. | . Avenue House, Woodhouse Lane. |
| 72 | Marshall, John, F.R.A.S. | . Church Institute. |
| 60 | Marshall, Thomas, M.A. | . Highfield, Chapel-Allerton. |
| 24 | Matthews, Rev. J. H. D. | . Grammar School, Leeds. |
| 27 | Maude, William Henry | . Middleton Lodge, Leeds. |
| 117 | Middleton, Arthur | . Hawk Hills, Chapel-Allerton. |
| 66 | Nicholson, A. H. | . |
| 30 | Nicholson, Marshall | . Middleton Hall, near Leeds. |
| 64 | *Nickols, Richard | . |
| 67 | Nunneley, A. G. | . 9, Beech Grove Terrace. |
| 68 | Oxley, James Walker | . 28, Commercial Street. |
| 93 | Palmer, Henry John | . 55, Albion Street. |
| 28 | *Passavant, P. W. | . |
| 82 | Pearson, John Thomas | . The Hall, Melmerby, Thirsk. |
| 11 | Price, Mrs. William N. | . Hillary Place. |
| 38 | *Ralph, John, M.A. | . |
| 69 | Reynolds, Richard, F.C.S. | . Cliff Lodge, Hyde Park. |
| 18 | Robson, A.W. M., F.R.C.S. | . Hillary Place. |
| 105 | Ryder, Charles | . Gledhow Hill. |
| 112 | Sagar-Musgrave, J. M. | . Red Hall, Shadwell. |
| 92 | Scattergood, Thomas | . 41, Park Square. |
| 119 | Schunck, John Edward | . Gledhow Wood, Gledhow. |
| 57 | Stringer, John William | . Inglebank, Far Headingley. |
| 87 | Talbot, Rev. Canon, D.D. | . The Vicarage, Hillary Place. |
| 73 | Teale, T. P., M.A., F.R.S. | . North Grange, Headingley. |
| 74 | Teasdale, Washington | . Bainbrigge Road, Headingley. |

76	*Tennant, Thomas	.	
78	*Tetley, F. W.	.	
58	Thompson, Chas. F.	.	34, College Road, Leeds.
49	Thorp, John Hall	.	Far Headingley.
79	Turner, Richard B.	.	Oakleigh, Buxton.
80	Wailes, William	.	2, Albion Place.
71	Ward, John	.	Moor-Allerton House.
111	*Watson, William Henry	.	
41	Webb, Joseph S.	.	26, Park Row.
97	Weston, Edward	.	Newton Park Villa, New Leeds.
42	Whiting, John	.	Cliff Road.
83	Wicksteed, J. H., M. Inst. C. E.	.	1, Grosvenor Terrace, Headingley.
31	Wilkinson, William M.	.	8, East Parade.
85	*Wilson, John	.	
17	Wilson, Richard	.	28, Commercial Street.
35	Wood, Philip T.	.	22, Lyddon Terrace.

ORDINARY MEMBERS,

WITH AN ANNUAL SUBSCRIPTION OF TWO GUINEAS.

11	Ramskill, Josiah	.	29, Meadow Lane.
13	Stratten, Rev. J. R.	.	Park Square.

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WITH AN ANNUAL SUBSCRIPTION OF ONE GUINEA.

13	Abbott, Robert	.	13, St. John's Terrace.
2	Baines, Talbot, B.A.	.	Albion Street.
48	Barran, Rowland H.	.	Shaw Lane, Headingley.
4	Barwick, J. M.	.	Low Hall, Yeadon.
5	Bedford, James E.	.	Cardigan Road.
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40	Bodington, Prof. N., M.A.	.	The Yorkshire College.
8	Bolland, W. T.	.	
10	Bousfield, Charles Edward	.	St. Mary's Mount.

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| 15 | Bray, George | . | Blackman Lane. |
| 72 | Brigg, Matthew A. | . | 12, Sholebroke Avenue. |
| 11 | Briggs, Riley | . | Springfield Mount. |
| 75 | Brunton, George | . | Hillary Mount, Woodhouse Lane. |
| 14 | Corson, George | . | Wood Lane, Headingley. |
| 41 | Crossley, Thomas | . | Highfield House, Headingley. |
| 35 | Croysdale, Mrs. James | . | 29, Cromer Terrace. |
| 16 | Denny, T. G. | . | 2, Moor View, Hyde Park. |
| 32 | Dixon, A. S. | . | Woodlands, Harehills Lane. |
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| 20 | Eddison, Robert William | . | The Manor, Adel. |
| 22 | Fairley, Thomas, F.R.S.E. | . | 8, Newton Grove. |
| 21 | *Firth, William | . | |
| 69 | Fraser, James B. | . | 8, Park Square. |
| 24 | Gascoigne, F. C. Trench | . | Parlington Park, nr. Garforth. |
| 25 | Goodman, Prof. John | . | The Yorkshire College. |
| 12 | Hadow, Reginald | . | Bank of England, Leeds. |
| 27 | *Hargrave, John | . | |
| 60 | Harland, J. W. | . | Headingley. |
| 28 | Hepper, John | . | Clareville, Headingley. |
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| 81 | *Holroyd, James | . | |
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| 31 | Illingworth, William | . | Flower Bank, Burley, Leeds. |
| 33 | Irwell, Arthur F. | . | 8, Park Drive, Heaton, Bradford. |
| 6 | Jackson, Richard | . | Beech Villa, Cardigan Road. |
| 34 | Jackson, Rt. Hon. W. L.,
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| 63 | *Jowitt, Miss E. M. | . | |
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| 39 | *Lawson, John | . | |
| 88 | Legard, Albert G., M.A. | . | The Briary, Harrogate. |
| 23 | Lupton, Prof. Arnold | . | 6, De Grey Road. |
| 44 | McCheane, Miss | . | The Hollies, Headingley. |

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 46 Middleton, Gilbert . Calverley Chambers, Victoria Sq.
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 70 Nelson, James Henry . Brook House, Sandal, Wakefield.
 58 Nicol, W. H. . 2, Clarendon Road.
 51 Nunneley, Thomas . 9, Beech Grove Terrace.
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 54 Nussey, Thomas . Virginia House, Headingley Hill.
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 56 Nussey, Peter . Springville, Shaw Lane.
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Foster, George	. Bleak House, Harehills.
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Josephy, Bernard	. 25, Hyde Terrace.
Josephy, Henry	. 5, Beech Grove Terrace.

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Pepper, J. E.	. 42, Hyde Terrace.
Pepper, Miss	. Newton Green Hall.
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Sanders, T. W.	. Do.
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Brigg, Mrs. T. S.	. Cromer Terrace.
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Crampton, Miss A.	. Do.
Crampton, Miss Louisa	. Do.
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Croysdale, Miss	. Do. do.
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Hassé, Eric	. 31, Commercial Street.
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Josephy, Mrs. H.	. 5, Beech Grove Terrace.
Josephy, Miss	. Do.
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Nelson, Miss Louisa	. Do. do.
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Nussey, Mrs.	. Springville, Shaw Lane.
Nussey, Miss E.	. Do. do.

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Ryder, Miss Louisa	. Do.
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Saville, Miss S. E.	. Do.
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FORM OF A BEQUEST TO THE SOCIETY.

Every person desirous of bequeathing to the Society any sum of Money, Specimens, Books, Instruments, or other Property, is requested to make use of the following Form:—

I give and bequeath to the Trustees for the time being of the Society established at Leeds, called "THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY," for the use of the said Society, the sum of _____, to be paid out of such part of my personal Estate as I may legally charge therewith. [Or here enumerate the Effects or Property intended to be bequeathed.] And I direct that the Receipt of the Treasurer of the said Society for the time being shall be an effectual discharge to my Executors for the said Legacy.

THE
SEVENTY-THIRD REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1892-3.

READ AT THE ANNUAL MEETING, MAY 2nd, 1893.

LEEDS:
JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS,
78, ALBION STREET.
—
1893.

THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY consists of the following Classes of Members and Subscribers:—

- (1.) ORIGINAL PROPRIETARY MEMBERS (holding £100 Shares), who are entitled to personal admission to the Museum, Library, Lectures, and all other Meetings of the Society, and to two transferable tickets to admit visitors to the Lectures. They are exempt from Annual Subscription.
- (2.) NEW PROPRIETARY MEMBERS (holding £50 Shares), who are entitled to similar personal privileges, and to two transferable tickets. Subscription, £1 1s. per annum.
- (3.) ORIGINAL ORDINARY MEMBERS (holding £3 3s. Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £2 2s. per annum.
- (4.) NEW ORDINARY MEMBERS (holding £20 Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £1 1s. per annum.

The following are entitled to personal admission to the Museum, Library, and Lectures, but not to business meetings; nor have they any transferable tickets to admit visitors:—

- (5.) HONORARY MEMBERS, elected on the recommendation of the Council.
- (6.) SUBSCRIBERS of £1 1s. per annum.
- (7.) SUBSCRIBERS of 7s. 6d. per annum, being Ladies or Young Persons resident with Members, or with Subscribers in Class (6).

A list of shares from time to time offered for sale by Members is kept in the office, and information as to price, &c., may be obtained from the Secretary.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members, voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE CLOSE OF THE

SEVENTY-THIRD SESSION.

During the Seventy-third Session of the Society the General Meetings have been well attended, and the subjects of the Lectures of very varied interest.

The thanks of the Society are due to Mr. C. Milnes Gaskell, Mr. Alfred Austin, The President (Rev. J. H. D. Matthews), and Rev. C. G. Lang, who gave their services gratuitously. The List of Lectures was as follows :—

- 1.—“Social Pictorial Satire.” By GEORGE DU MAURIER. *Oct. 18th, 1892.*
- 2.—“Photographs of Flying Bullets, &c.” By C. V. BOYS, F.R.S. *Nov. 1st, 1892.*
- 3.—“The Songs of Birds.” By W. WARDE FOWLER, M.A. *Nov. 15th, 1892.*
- 4.—“Phases of Plant Life in the Tropics.” By D. MORRIS, M.A., F.L.S., Assistant Director of the Royal Gardens, Kew. *Dec. 6th, 1892.*
- 5.—“Recent Excavations in Greece.” By CHARLES WALDSTEIN, Ph.D. *Dec. 20th, 1892.*
- 6.—“Richard Monckton Milnes, Lord Houghton.” By C. MILNES GASKELL, M.A. *Jan. 17th, 1893.*
- 7.—“Poetry and Pessimism.” By ALFRED AUSTIN. *Feb. 7th, 1893.*
- 8.—“Style.” By The PRESIDENT (Rev. J. H. D. MATTHEWS, M.A.). *Feb. 14th, 1893.*
- 9.—“Methods by which Animals conceal themselves.” By E. B. POULTON, M.A., F.R.S. *Feb. 21st, 1893.*

10.—“Walt Whitman.” By Rev. C. G. LANG, M.A., Fellow of All Souls’ College, Oxford. *March 7th, 1893.*

11.—“Animal Pedigrees.” By Prof. A. MILNES MARSHALL, D.Sc., F.R.S. *March 21st, 1893.*

In May and June, 1892, a Course of six Object Lessons on Natural History was given on Saturday mornings by Miss Simpson to a class of young persons. The attendance was satisfactory, and the course was financially successful. A similar course will be given by Miss Simpson next summer.

The number of Members and Subscribers is as follows:—

		1892	1893
		<hr/>	<hr/>
Original Proprietary Members (78 shares)	...	71	71
New Proprietary Members (121 shares)	...	94	97
Ordinary Members	... ..	2	2
New Ordinary Members...	... ..	77	76
Annual Subscribers of £1 1s.	... ..	126	116
Annual Subscribers of 7s. 6d.	... ..	129	121
		<hr/>	<hr/>
Total	... ..	499	483
		<hr/>	<hr/>

24,346 visitors have paid for admission to the Museum.

Our Mineralogical collection has been enriched by 187 specimens, presented by the Trustees of the British Museum, through the kindness of Mr. L. Fletcher, F.R.S., the Keeper of the Minerals; and by a valuable series of specimens of gold-bearing strata from Mashonaland, presented by Mr. J. W. Webster.

Gifts of Fossils have been received from Mr. John Simpson, Mr. Fisher and other gentlemen, and a valuable collection of British Trilobites has been obtained by purchase.

Numerous additions have been made to the collection of Insects.

By the loan of examples of British Marine Shells from the Conchological Society, a fair collection of the British Mollusca is now on view in the Museum ; this Society has also presented several specimens of Echinoderms from Devonshire.

Many gifts of Zoological objects have been received, including several valuable fishes from Mr. W. E. Collinge, *Euthemisto compressus*, a crustacean new to Britain, from Mr. W. D. Roebuck, and two skulls of the Tasmanian Wolf from Mr. W. H. Gellibrand, an Honorary Member of the Society.

Mr. Hanson has presented a large photograph of Mr. William Osburn (b. 1793), of Leeds.

Though the debt due from the Society for so long has at last been paid off, it is a matter of some concern that this is due to an increase in the somewhat fluctuating and uncertain receipts from our Hall and Library, while the more reliable revenue derived from Annual Subscribers, the number of whom constitutes a fair index of the interest taken by the public in our work, continues to show a steady decrease.

The Council desire to record their regret at the loss which they have sustained by the death of their colleague, Mr. W. W. Best, who, as long as health permitted, took much interest in the work of the Society. By the death of Sir Richard Owen the Society has lost one of its oldest Honorary Members, and the Scientific World one of its foremost and most venerated names.

On February 18th, 1893, Mr. E. R. Waite resigned his position as Curator of the Museum, having been appointed to a similar position at Sydney. Mr. Henry Crowther, who has returned to us after an absence of twelve years, entered upon the duties of Curator on February 20th, 1893.

*Summary of Meteorological Observations taken at the Philosophical Hall,
Leeds, during the year 1892.*

1892.	Mean Temperature.	Mean Height of Barometer (inches).	Total Amount of Rain in inches.	
			Museum.	Woodhouse Cliff.
January	36·7	29·627	1·43	1·98
February	38·0	29·602	2·11	2·21
March	37·6	29·880	·80	1·00
April	44·6	29·853	1·06	1·24
May	52·6	29·815	2·91	2·47
June	54·2	29·656	4·23	4·31
July	56·7	29·851	1·81	1·78
August	59·1	29·705	2·67	2·79
September	54·7	29·745	1·53	1·53
October	44·9	29·539	7·01	6·62
November	44·0	29·828	1·80	1·94
December	35·8	29·788	·52	·65

Mean monthly temperature—46·5°.

Mean monthly height of the barometer—29·740 inches.

Total rainfall for the year—Museum 27·88 inches; Woodhouse Cliff 28·52 inches.
Average rainfall at the Museum for the ten years 1883-1892—24·12 inches.

Greatest degree of heat, indicated by the thermometer in the shade—80° on June 9th and August 23rd; minimum—19° on December 26th, 28th, 29th.

Greatest barometric pressure—30·498 inches on March 30th, the temperature of the mercury being 50°; least pressure—28·840 inches on February 2nd, the temperature of the mercury being 50°.

Greatest fall of rain (during 24 hours)—2·84 inches on October 14th.

Latitude, 53° 48' 20" N.; longitude, 1° 33' W. Height of the cistern of the barometer above the level of the sea, 137 feet; height of the rain gauge above the street, 46 feet.

SUNSHINE AT LEEDS IN 1892.

The observations were made by Jordan's Photographic Sunshine Recorder at the following stations:—

1. The Museum, situate in the centre of the city; elevation above the sea, 137 feet.
2. Woodhouse Cliff, $\frac{1}{2}$ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the city.
4. Union Infirmary, Burmantofts, 1 mile from the centre of the city; elevation, 200 feet; industrial district.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible duration.
JANUARY	1	30'7	11'8
	2	31'3	12'0
	3	51'7	19'9
	4	41'2	15'9
FEBRUARY	1	49'3	17'7
	2	58'4	21'0
	3	68'2	24'3
	4	58'2	20'9
MARCH	1	89'8	24'2
	2	115'5	31'4
	3	142'1	38'7
	4	119'4	32'3
APRIL	1	151'9	36'6
	2	182'2	43'9
	3	202'2	48'7
	4	189'3	45'7
MAY	1	146'5	30'4
	2	168'3	35'0
	3	181'7	37'7
	4	177'7	36'3
JUNE	1	142'7	28'6
	2	175'5	35'5
	3	179'3	30'3
	4	182'8	36'9
JULY	1	101'0	20'3
	2	131'2	26'4
	3	122'9	24'7
	4	120'2	24'2
AUGUST	1	109'1	24'3
	2	140'2	31'2
	3	151'0	33'6
	4	133'5	29'7
SEPTEMBER	1	97'7	25'9
	2	114'7	30'4
	3	130'2	34'5
	4	100'5	27'2
OCTOBER	1	62'7	19'1
	2	86'5	26'3
	3	99'3	30'2
	4	88'7	26'9
NOVEMBER	1	4'0	1'5
	2	20'8	7'8
	3	38'0	14'4
	4	22'3	8'4
DECEMBER	1	2'7	1'1
	2	18'2	7'5
	3	50'5	20'8
	4	22'8	9'4

SUMMARY FOR THE YEAR.

Museum	22'2	per cent. of possible duration.
Woodhouse Cliff	27'9	" " "
Lawnswood	31'8	" " "
Burmantofts	23'2	" " "

27'5 per cent. mean for 1892.

22'2	"	"	1391.
24'4	"	"	1390.
20'7	"	"	1389.
19'9	"	"	1383.
28'0	"	"	1337.
23'8	"	"	six years.

The Meteorological Office publishes the following records of sunshine in 1892, as observed at stations taken as representing specified districts:—

	Percentage of possible duration.	Difference from mean.
Scotland, N. (Stornoway, &c.)	25	—1
" E. (Aberdeen, Marchmont)	30	—1
" W. (Glasgow, Douglas, Isle of Man)	32	+2
England, N.E. (Durham, York)	30	+2
" N.W. (Stonyhurst, Blackpool, Llandudno)	32	+2
" Mid. (Cirencester, Oxford, &c.)	33	+2
" S. (London, Hastings, Southampton, &c.)	33	0
" E. (Hillington, Geddystone, Cambridge)	35	+1
" S.W. (Pembroke, Falmouth, Plymouth, &c.)	39	+3
Ireland, N. (Armagh, Markree Castle)	30	+2
" S. (Dublin, Parsonstown, Valencia)	23	0
Channel Islands (Jersey)	45	+2

SUMMARY.

35'2	per cent. mean for United Kingdom, 1892.
32'6	" " " " " " " " " " " "
30'7	" " " " " " " " " " " "
29'2	" " " " " " " " " " " "
27'5	" " " " " " " " " " " "
35'6	" " " " " " " " " " " "
	1391.
	1390.
	1389.
	1383.
	1337.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Payments for the year 1892-3.

RECEIPTS.			PAYMENTS.		
	£	s. d.		£	s. d.
To Balance in hand, May 1st, 1892 ...	...	1 9 1	By Balance due to Bank, May 1st, 1892	...	65 12 5
" Annual Subscriptions, viz.:			" Repairs and Alterations	...	43 10 3
79 New Proprietary Members, at 21s. ...	82	19 0	" Rates and Taxes	...	4 8 8
2 Original Ordinary	42s. ...	4 4 0	" Fire Insurance	...	12 10 0
62 New Ordinary	21s. ...	65 2 0	" Coals, &c.	...	23 15 6
111 Annual Subscribers, at 21s. ...	116	11 0	" Gas	...	19 10 10
120 Annual Subscribers, at 7s. 6d.	45	0 0	" Cleaning	...	7 12 4
" Arrears ...	8	2 0	" Salaries	...	111 7 7
" Rent, viz.:	321	18 0	" Fee to Auditor	...	291 16 1
Cells	...	40 0 0	"	...	2 2 0
Lecture Room	...	223 19 0	" Collections, viz.:	...	293 18 1
" Receipts from Visitors to Museum	...	263 19 0	Geological	...	10 0 0
" Sale of Guides	...	101 8 10	Zoological	...	7 7 8
" Sundries	...	4 6 9	Library	...	28 11 6
	...	1 9 0	Scientific Apparatus	...	3 13 6
	...	5 15 9	Postages	...	49 12 8
	...		" Advertising and Printing	...	11 2 10
	...		" Lectures	...	34 14 9
	...		" Interest and Bank Commission	...	91 12 4
	...		" Sundries	...	2 17 0
	...		" Electric Lighting	...	11 5 3
	...		" Balance at Bank	...	151 12 2
	...		" in hand	...	3 18 2
	...			...	17 18 4
	...			...	0 11 3
	...			...	£694 10 8

I have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.
May 16th, 1893.
 CHAS. BEEVERS,
 CHARTERED ACCOUNTANT.

LIST OF DONATIONS AND ADDITIONS

TO THE

SOCIETY'S MUSEUM AND LIBRARY.

1892-3.

ZOOLOGY.

Two Skulls of Tasmanian Wolf (<i>Thylacinus cynocephalus</i>)	Mr. W. H. Gellibrand, Cleveland, Tasmania.
Small Trout and Pike.....	Mr. R. Fortune, F.Z.S., Harrogate.
<i>Attacus Atlas</i> from India	Mr. W. L. Joy, Headingley.
<i>Euthemisto compressus</i> from Redcar. A crustacean new to Britain	Mr. W. D. Roebuck, F.L.S., Leeds.
Larva of New Zealand Swift (<i>Hepialus</i> <i>virescens</i>), with fungus attached ...	Mr. Blenkhorn, Knaresbro'.
Nest of Long-tailed Tit (<i>Acredula</i> <i>rosea</i>).....	Rev. R. A. Summerfield, B.A., North Stainley, Ripon.
Echinoderms from Devonshire :— (<i>Astropecten irregularis</i> , <i>Ophicoma</i> <i>rosula</i> , <i>Ophiura texturata</i>)	Conchological Society of Great Britain and Ire- land.
Fishes, viz. :— <i>Cobites fossilis</i> , <i>Silurus</i> , <i>Carassius auratus</i> , <i>Zoarces viviparus</i> }	Mr. W. E. Collinge, Mason College, Birmingham.

GEOLOGY.

<i>Actinocrinus</i> , Carboniferous Limestone, Lothersdale	Mr. Thos. Fisher, Carhead, Crosshills.
<i>Calamites</i> , Carboniferous Sandstone, Woodlesford.....	Mr. W. E. Garforth, F.G.S., Halesfield, Normanton.
Specimens of <i>Poteriocrinus</i> and <i>Pro-</i> <i>ductus</i> , Carboniferous Limestone, Wirksworth	Mr. J. Simpson, Hopwood Stone Co., Wirksworth.
Collection of British Trilobites	Purchased.

MINERALOGY.

- Collection of 187 Minerals from Mr. }
 L. Fletcher, F.R.S., Keeper of the } The Trustees of the British
 Minerals, British Museum } Museum.
-
- Collection of 40 Copper Coins, chiefly } Mr. W. J. Snowdon, Royal
 Roman } Park Mount, Hyde Park.
-
- Portrait (photograph) of Wm. Osburn, } Mr. Hanson, Photographer,
 Egyptologist } Great George St., Leeds.
-
- Copy of the Sheffield Weekly Journal: }
 or, Doncaster Flying-Post, Tuesday, } Prof. Miall, F.R.S., York
 September 13, 1757..... } shire College.

PUBLICATIONS.

- Illustrations of Lepidoptera Heterocera, }
 Part IX., 1893 }
 Catalogue of British Echinoderms, } British Museum.
 1892..... }
 Guide to Sowerby's Models of British }
 Fungi, 1893 }
- Fauna Gaskohle und der Kalksteine }
 der Permformation Böhmens..... } Purchased.
- "Vagrancy" (pamphlet), by Geo. Paul, }
 F.R.Met.S. } The Author.
 "Germs", do. do. }
- Roman Inscriptions in Britain, II., }
 1890-91, by F. Haverfield, M.A., } The Author.
 F.S.A..... }
- British Jurassic Gasteropoda, by W. H. }
 Hudleston, M.A., F.R.S., and Edward } The Authors.
 Wilson, F.G.S. }
- Liassic Sections near Bridport }
 (pamphlet), by John F. Walker, } The Author.
 M.A., F.G.S. }
- Contributions to Canadian Micro- }
 Palæontology } The Government.
- An Epitomised Review of the Prin- }
 ciples and Practice of Maritime } The Author.
 Sanitation, by Joseph Holt, M.D. ... }

PERIODICALS.

WEEKLY.

Nature Purchased.

BI-WEEKLY.

Bollettino delle Publicationi Italiane The Compiler

MONTHLY.

Annals and Magazine of Natural
History } Purchased.

Geological Magazine Purchased.

Journal of the Chemical Society The Society.

Monthly Notices of the Royal Astro-
nomical Society } The Society.

Philosophical Magazine and Journal
of Science } Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical
Society } The Society.

QUARTERLY.

Quarterly Journal of Microscopical
Science } Purchased.

Quarterly Journal of Geological Society The Society.

Quarterly Returns of Marriages,
Births, and Deaths..... } Registrar-General.

Journal of the Anthropological
Institute } The Institute.

Zeitschrift für Wissenschaftliche Zoo-
logie } Purchased.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions..... Purchased.

Proceedings of the Royal Society ... The Society.

Proceedings of the Royal Institution
of Great Britain, Vol. XIII., Part
III., 1893 } The Institution.

British Association Report, 1892	The Association.
Greenwich Observations, 1890	The Astronomer-Royal.
Memoirs of the Royal Astronomical Society	The Society.
Radcliffe Astronomical and Meteorological Observations	
Symons's British Rainfall, 1891	Purchased.
Monographs of the Palæontographical Society, Vol. XLVI., 1892.....	Purchased.
Proceedings of the Geologists' Association, Vol. XII., Part VIII., 1892	
Transactions of the Leeds Geological Association	The Association.
Proceedings of the Liverpool Geological Society, Session 1891-92 ...	The Society.
Journal of the Liverpool Geological Association	
Transactions of the Manchester Geological Society, Vol. XXII., Parts VI. and VII., 1892	The Society.
Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne.....	
Proceedings of the Birmingham Philosophical Society	The Tyneside Naturalists' Field Club.
Report of the Bradford Philosophical Society, 1892-3	
Annual Report of the Yorkshire Philosophical Society, 1891	The Society.
Report of the Halifax Literary and Philosophical Society	
Transactions of the Leicester Literary and Philosophical Society, Vol. II., Part XI.	The Society.
Report of the Committee of Leicester Town Museum	
Annual Report of the Brighton Town Museum	The Museum.
Annual Report, Middlesex Hospital...	

Annual Report of the Birkenhead Literary and Scientific Society	} The Society.
Annual Report and Transactions of the Hull Literary and Philosophical Society	} The Society.
Proceedings of the Liverpool Literary and Philosophical Society	} The Society.
Annual Report and Proceedings of the Liverpool Science Students' Association	} The Association.
Memoirs and Proceedings of the Man- chester Literary and Philosophical Society, 4th Series, Vol. VII., No. I., 1892-3	} The Society.
Annual Report of the Sheffield Literary and Philosophical Society }	The Society.
Annual Report of the Chester Society of Natural Science and Literature }	The Society.
Transactions of the Leeds Naturalists' Club and Scientific Association..... }	The Association.
Report of the Manchester Museum, Owens College..... }	The Curator.
Publications of the Ray Society	Purchased.
Annual Report of the Royal Cornwall Polytechnic Society, 1891	} The Society.
Report of Associated Architectural Societies, Vol. XXI., Part I., 1891 }	The Society.
Journal of the Chester Archæological and Historic Society	} The Society.
Geological Record	Purchased.
Transactions of the Yorkshire Natural- ists' Union, Parts I.—XVII., 1877-91 }	The Union.
Proceedings of the Royal Society of Edinburgh, Vol. XVIII., 1890-91 ... }	The Society.
Transactions do. do. Vol. XXXVI., Part III..... }	
Transactions of the Edinburgh Geo- logical Society..... }	The Society.

Proceedings of the Glasgow Philo- sophical Society, Vol. XXIII., 1891-2.	} The Society.
Proceedings of the Berwickshire Naturalists' Club, 1890	} The Club.
Scientific Proceedings of the Royal Dublin Society, Vol. VII., Parts III. and IV., 1892	} The Society.
Scientific Transactions do. Vol. IV., Parts IX.—XIII.	
Transactions of the Royal Irish Academy, Vol. XXIX., Parts XVIII. and XIX., 1892	} The Academy.
Proceedings do. do. Vol. II., No. II., 1892	
Journal of the Royal Geological Society of Ireland	} The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club, 1891-2	} The Club.
Publications of the Royal Swedish Academy of Sciences.....	} The Academy.
Papers of the Royal University of Norway	} The University.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Förhand- linger.....	} Royal Danish Society of Sciences.
Bulletin Société Impériale, Moscow ...	} The Society.
"Leopoldina" Amtliches organ der Kaiserlichen, Leopoldino-Carolini- schen Deutschen Akademie der Naturforscher	} The Academy.
Memoires de la Société d'émulation d'Abbeville	} The Society.
Mittheilungen der Kais. Königl. Geo- graphischen Gesellschaft in Wien ...	} The Society.
Australasian Association Report	} The Association.
Journal and Proceedings of the Royal Society of New South Wales, Vols. XXV., XXVI., 1892	} The Society.

Records of the Geological Survey of N.S.W., Vol. III., Part II., 1892 ...	The Surveyor.
Memoirs of the Geological Survey of N.S.W.	
Annual Report and Papers of the Department of Mines, N.S.W., 1891	The Department.
Transactions and Proceedings of the Royal Geographical Society of Australasia (N.S.W. Branch).....	The Society.
Prodromus of the Zoology of Victoria	The Editor.
Victorian Year-Book, Vol. II., 1891-2. By Henry Heylyn Hayter, C.M.G.)	The Author.
Records of the Australian Museum, Vol. II., Nos. 3 and 4, 1892	
Report of the Trustees of the Austra- lian Museum.....	The Trustees.
Catalogue of Australian Mammals ...	
Proceedings of the Royal Society of Queensland	The Society.
Transactions and Proceedings of the New Zealand Institute, Vol. XXIV., 1891	The Institute.
Papers and Proceedings of the Royal Society of Tasmania, 1891.....	
Proceedings and Transactions of the Royal Society of Canada, Vol. IX., 1891	The Society.
Proceedings of the Canadian Institute	
Annual Report do.	The Institute.
Transactions do. Vol. III., Part II., 1892	
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	The Institute.
Geological and Natural History Survey of Canada	
Annual Report and Papers—do.	Department of the Interior.
Contributions to Canadian Palæon- tology	
Memorias de la Sociedad Científica (Mexico)	The Society.

" Boletin Mensual " Observatorio Meteorologico-Magnetico, Central de Mexico	} The Editor.
Annuario del Observations Astron- omico Nacional, Mexico.....	
Boletin del Observatorio Astronomico Nacional de Tacubaya	} The Astronomer.
Report of the Muséum National, Rio-de-Janeiro.....	
Archivos ditto.....	} The Observer.
Cape Meridian Observations	
Annals of the Cape Observatory, Vol. I., Parts II—IV.	} Directeur Général.
Transactions of the American Philo- sophical Society	
Proceedings do. Vol. XXX., 1892	} Cape Astronomer-Royal.
United States Geological Survey, Annual Report	
Contributions to American Ethnology, Vol. VII.	} The Society.
Report of the Smithsonian Institution, 1890	
Smithsonian Miscellaneous Collections	} The Department.
Smithsonian Contributions	
Miscellaneous Publications of the Bureau of Ethnology	} The Institution.
Bulletins of United States National Museum	
Catalogue of Economic Geology and Metallurgy	} The Museum.
Writings of Dr. Charles Girard.....	
Bibliography of the Athapascan Lan- guages	} The Academy.
Bibliography of the Algonquian Lan- guages	
Proceedings of United States National Museum	} The Academy.
Report do. do.	
Transactions of the Academy of Science of St. Louis	} The Academy.
Proceedings of the Academy of Natural Sciences of Philadelphia, Parts I., II., and III., 1892	
Papers do. do.	} The Academy.

Proceedings of the American Academy of Arts and Sciences, New Series, Vol. XVIII., 1890-91	} The Academy.
Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	} The Academy.
Memoirs of the National Academy of Sciences, Washington.....	} The Academy.
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Connon, Mrs. J. W.	. Park Row.
Crampton, Miss	. Parcmont, Roundhay.
Crampton, Miss A.	. Do.
Crampton, Miss Louisa	. Do.
Crampton, Charles	. Do.
Crawford, Mrs. J. W.	. Newton Lane.
Croysdale, Mrs. C.	. 13, Shaw Lane.
Croysdale, Mrs. J.	. Heathfield, Monk Bridge Road.
Croysdale, Miss	. Do. do.
Dalton, Mrs. G.	. The Yews, North Hill Road.
Day, Miss	. Mrs. Stuhlmann, Cavendish Rd.
Ellison, Miss	. 10, De Grey Road.
Fox, Mrs. J.	. Stourton Grange, Hunslet.
Glover, Miss	. 16, De Grey Road.
Glover, Miss Mary	. Do.
Green, Miss	. 1, Tanfield Place.
Green, Miss Ethel	. Do.
Hall, Miss	. St. Mark's Villas.
Hallilay, Mrs.	. 28, Burley Road.
Hannam, Mrs. W. S.	. 4, East Parade.
Hartnell, Mrs. Wilson	. Aysgarth, Roundhay.
Hassé, Mrs.	. 31, Commercial Street.
Hassé, Eric	. Do.
Hepper, Miss M. E.	. Clareville, Headingley.

Hewetson, Mrs. H. B.	. 9, Hanover Square.
Hewson, Mrs. T.	. The Hollies, Roundhay.
Hirsch, Mrs. Paul	. 29, Cookridge Street.
Hirsch, Miss Annie	. Do.
Hogg, Mrs. Henry	. Mr. Hartley, Blenheim Terrace.
Holgate, Mrs. B.	. Regent House, Headingley.
Holroyd, Miss G.	. 6, Cavendish Road.
Horsfield, Mrs. H. K.	. 14, Oakfield, Headingley.
Jackson, Miss	. Allerton Hall, Leeds.
Josephy, Mrs. B.	. 25, Hyde Terrace.
Josephy, Ernest H.	. Do.
Josephy, Mrs. H.	. 5, Beech Grove Terrace.
Josephy, Miss	. Do.
Josephy, H.	. Do.
Kitson, Mrs. F. J.	. Oatlands, Burley, Leeds.
Lawson, Miss	. Bramhope.
Little, Mrs. F. Buller	. Clough House, Chapel-Allerton.
Little, Miss Edith	. Do. do.
Marshall, Mrs. D. D.	. 231, Hyde Park Road.
Mathers, Miss	. Hanover House.
Morley, Mrs.	. 14, Westfield Terrace, Chapeltown.
Mozley, Mrs.	. Southleigh, Headingley.
Mozley, Miss	. Do. do.
Myers, Miss	. Mrs. Stuhlmann, Cavendish Rd.
Naylor, Mrs. J. W.	. Allerton House, Chapeltown.
Nelson, Miss C. E.	. St. John's Cottage, St. John's Rd.
Nelson, Miss Louisa	. Do. do.
Nicholson, Mrs. J. C.	. Ashfield, Headingley.
Nicholson, Miss	. Do. do.
Nussey, Miss	. Potternewton Hall.
Nussey, Mrs.	. Springville, Shaw Lane.
Nussey, Miss E.	. Do. do.
Nussey, Miss M.	. Do. do.
Pepper, Mrs. J. E.	. 42, Hyde Terrace.
Phillips, Miss	. Mrs. Stuhlmann, Cavendish Rd.

Ramsbotham, Miss	. 16, Park Place.
Ransome, Mrs.	. 3, St. Chad's Villas, Headingley.
Redmayne, Mrs. John	. Grove House, Headingley.
Richardson, Mrs.	. Cliff Road.
Rickards, Miss	. Wortley.
Robson, Mrs. A. W. Mayo	. Hillary Place.
Rumboll, Mrs.	. Hope Villa, Woodhouse Lane.
Ryder, Miss A. E.	. Gledhow Hill.
Ryder, Miss E. I.	. Do.
Ryder, Miss Louisa	. Do.
Sanders, Miss	. 5, Blenheim Square.
Saville, Miss S. E.	. 15, Springfield Place.
Scatcherd, Mrs. O.	. Morley.
Scattergood, Miss	. 41, Park Square.
Slade, Mrs. R.	. 14, Springfield Mount.
Slade, R. H.	. Do.
Somers, Mrs.	. 48, Woodhouse Lane.
Stables, Mrs. M.	. Hope Villa, Armley.
Stables, Miss	. Horsforth.
Stables, Miss Lucy	. Do.
Stockdale, Mrs. T.	. Spring Lea.
Stroud, Mrs. W.	. Ashwood Villas.
Talbot, Mrs. G.	. Southfield, Burley.
Talbot, Miss	. Do.
Talbot, Miss L.	. Do.
Teale, Mrs.	. 52, Boar Lane.
Teale, Miss	. North Grange, Headingley.
Tetley, Mrs. C. F.	. Cardigan Road, Headingley.
Thornley, Miss	. Mr. Illingworth, Flower Bank.
Thornley, Miss M.	. Mr. Tetley, Cardigan Road.
Walker, Mrs. A. T.	. Bainbrigge Terrace, Headingley.
Walker, Miss E. H.	. Newton Park.
Walker, Miss M. H.	. Do.
Walker, Miss M. I.	. Do.
Ward, Mrs. G.	. Buckingham Terrace.

Watson, Mrs. Charles	. Burton Grange, Far Headingley.
Watson, Miss	. 52, Boar Lane.
Wicksteed, Miss C.	. Mr. E. A. Lupton, Horsforth.
Willson, Miss Emilie Dorothy	. 121, Sheepscar Street.
Willson, Miss Margaret	. Do.
Wood, Miss	. 11, St. Mark's Terrace.

Members and Subscribers are requested to inform the Secretary of any errors that may be found in the above list.

HONORARY MEMBERS.

Sir Rutherford Alcock, K.C.B.,
D.C.L., Athenæum Club,
London.

Professor T. Clifford Allbutt,
M.D., F.R.S., Cambridge.

The Right Rev. Bishop Barry,
D.D., Canon of Windsor,
Windsor.

Prof. Graham Bell, The National
Telephone Company, Milk
St., Boston, Mass., U.S.A.

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Sir Frederick J. Bramwell, F.R.S.,
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Dr. Day, Mendoza, Argentine
Republic.

The Right Hon. Earl Fitzwil-
liam, K.G., Wentworth House,
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Square, London, W.

Herr Franz Foetterle, Secretary
of the Imperial Royal Geo-
graphical Society of Vienna.

George Lane Fox, Bramham
Park.

Francis Galton, F.R.S., 42, Rut-
land Gate, Knightsbridge,
London, S.W.

W. H. Gellibrand, Cleveland,
Ouse, Tasmania.

Cyril Graham, B.A., 9, Cleveland
Row, St. James's, London, S.W.

Wm. Hancock, F.L.S., F.R.G.S.,
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Wm. Hartley, Durban, Port
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The Right Rev. the Lord
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Rev. Thomas Hincks, B.A.,
F.R.S., Stoneleigh, Leigh
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Capt. James Holt, A.D.C.,
Government House, Welling-
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borough, Londesborough
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- Clements R. Markham, C.B.,
F.R.S., F.L.S., Sec. R.G.S., &c.,
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Ripon, K.G., F.R.S., F.G.S.,
Studley Royal, Ripon.
- Prof. A. W. Rücker, M.A.,
F.R.S., Errington, Clapham
Park, London, S.W.
- Henry Seebohm, F.L.S., F.Z.S.,
6, Tenterden Street, Hanover
Square, London, W.
- Col. Edmd. Smyth, Theescombe
House, Amberley, Stroud.
- John Robert Tennant, Kildwick
Hall.
- Prof. T. E. Thorpe, Ph.D.,
F.R.S., Normal School of
Science, South Kensington.
- Edward Harry Woods, Rosario,
Argentine Republic.

THE
SEVENTY-FOURTH REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1893-4.

READ AT THE ANNUAL MEETING, MAY 1st, 1894.

LEEDS:
JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS, 78, ALBION STREET.
—
1894.

THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY consists of the following Classes of Members and Subscribers:—

- (1.) ORIGINAL PROPRIETARY MEMBERS (holding £100 Shares), who are entitled to personal admission to the Museum, Library, Lectures, and all other Meetings of the Society, and to two transferable tickets to admit visitors to the Lectures. They are exempt from Annual Subscription.
- (2.) NEW PROPRIETARY MEMBERS (holding £50 Shares), who are entitled to similar personal privileges, and to two transferable tickets. Subscription, £1 is. per annum.
- (3.) ORIGINAL ORDINARY MEMBERS (holding £3 3s. Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £2 2s. per annum.
- (4.) NEW ORDINARY MEMBERS (holding £20 Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £1 is. per annum.

The following are entitled to personal admission to the Museum, Library, and Lectures, but not to business meetings; nor have they any transferable tickets to admit visitors:—

- (5.) HONORARY MEMBERS, elected on the recommendation of the Council.
- (6.) SUBSCRIBERS of £1 is. per annum.
- (7.) SUBSCRIBERS of 7s. 6d. per annum, being Ladies or Young Persons resident with Members, or with Subscribers in Class (6).

A list of shares from time to time offered for sale by Members is kept in the office, and information as to price, &c., may be obtained from the Secretary.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members, voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE CLOSE OF THE

SEVENTY-FOURTH SESSION.

During the Seventy-fourth Session of the Society the General Meetings have been well attended, and the interest in the Lectures has been maintained.

The thanks of the Society are due to Mr. W. H. St. John Hope, Prof. A. Smithells, Dr. Thorpe, Dr. Eddison, and Colonel Harding, who gave their services gratuitously. The List of Lectures was as follows :—

- 1.—“Kirkstall Abbey; its plan and arrangements, and the means being taken to preserve it.” By W. H. ST. JOHN HOPE, M.A.
Oct. 17th, 1893.
- 2.—“A Journey through Western Tibet.” By Mrs. BISHOP, F.R.G.S.
Nov. 7th, 1893.
- 3.—“The Interstellar Ether.” By Prof. OLIVER LODGE, D.Sc., F.R.S.
Nov. 21st, 1893.
- 4.—“Jonathan Swift.” By Rev. CANON AINGER, LL.D. *Dec. 5th, 1893.*
- 5.—“Flame.” By Prof. A. SMITHELLS, B.Sc. *Dec. 19th, 1893.*
- 6.—“The Appreciation of Music.” By W. H. HADOW, M.A., Mus. Bac.
Jan. 9th, 1894.
- 7.—“The Armies of to-day.” By Major G. F. R. HENDERSON. *Jan. 16th, 1894.*
- 8.—“Matabeleland, and our position in South Africa.” By ARCHIBALD R. COLQUHOUN. *Jan. 23rd, 1894.*
- 9.—“The Scientific Work of Galileo.” By Prof. J. A. FLEMING, M.A., D.Sc., F.R.S. *Feb. 6th, 1894.*
- 10.—“The Recent Solar Eclipse.” By Prof. T. E. THORPE, Ph.D., F.R.S.
Feb. 20th, 1894.

- 11.—“Climbing and Travel among the great mountains of Asia.” By W. M. CONWAY. *March 6th, 1894.*
- 12.—“Genius and Sanity.” By J. E. EDDISON, M.D. *March 20th, 1894.*
- 13.—“General Buonaparte.” By Colonel T. W. HARDING. *April 3rd, 1894.*
- 14.—“Mrs. Browning.” By ARTHUR SIDGWICK, M.A. *April 17th, 1894.*

During the Christmas Holidays the Curator delivered three Lectures, followed by practical demonstrations, on “Jelly-fishes and Corals,” “Shells and their Inmates,” and “Feathers and Wings.”

In the course of May and June Miss Simpson again delivered six Object Lessons on Elementary Natural History. Both these courses were successful and well attended.

The number of Members and Subscribers is as follows:—

Original Proprietary Members (78 shares)	...	...	62
New Proprietary Members (121 shares)	...	...	85
Ordinary Members	...	...	2
New Ordinary Members	...	...	69
Annual Subscribers of £1 1s.	...	...	121
Annual Subscribers of 7s. 6d.	...	...	126
Total	...	...	<u>465</u>

The shares of nine Original, of twelve New Proprietary, and of eight New Ordinary Members deceased, have not been transferred.

23,848 visitors have paid for admission to the Museum.

A case has been arranged to illustrate the formation of feathers, and another to show the regional distribution and classification of mollusca.

Arrangements have been made for receiving records of sunshine from Harrogate, Grange, Bowness, Keswick, Buxton, and Falmouth. The means are thus afforded of making valuable comparisons with the results obtained in our district.

The thanks of the Society are due to the Rev. W. Smith, of Shadwell, for the gift of a case of stuffed birds; to the Royal Swedish Academy for a valuable series of books; and to the Trustees of the British Museum for valuable catalogues of portions of their collections both at Bloomsbury and at Cromwell Road.

It is gratifying to find that, during the past year, the use of the Museum by Students has largely increased. Thirty visits were paid by classes in Biology and Geology of the Yorkshire College; two visits by classes from Board Schools; thirty-four visits by specialists. A case of Flint Implements was specially arranged for 27 University Extension Students from East Leeds, under the direction of the University Lecturer. Selected specimens were lent on ten occasions to the Yorkshire College, on two occasions to University Extension Lecturers, and on three occasions to the Leeds Naturalists' Field Club.

During the past year the Society has lost three Honorary Members by death.

The Right Rev. Edward Trollope, Bishop Suffragan of Nottingham, became Rector of Leasingham in 1843, and published many works on local antiquarian subjects between 1854-80. He was elected an Honorary Member in 1858, and read three Papers before the Society—"The Captivity of John, King of France," 1858; "Mazes and Labyrinths," 1858; "Norman Sculptures of Lincoln Cathedral," 1867.

Mr. W. Boyne, F.S.A., author of "Tokens of the 17th Century," and "The Yorkshire Library," &c., became a Proprietary Member in 1846, and was elected an Honorary Member in 1853. He read Papers before the Society on "Numismatology," 1848; "Antiquities of Cornwall," 1850.

Mr. John Robert Tennant was elected an Honorary Member in 1859. By his kind permission Dowkerbottom Cave was investigated at the cost of the Society, with the result that many human and canine crania and other fossils were added to the Museum.

*Summary of Meteorological Observations taken at the Philosophical Hall,
Leeds, during the year 1893.*

1893.	Mean Temperature.	Mean Height of Barometer (inches).	Total Amount of Rain in inches.	
			Museum.	Woodhouse Cliff.
January	37·2	29·874	·71	·43
February	39·6	29·454	3·03	2·47
March	44·8	29·901	·29	·36
April	50·2	30·016	·87	1·13
May	55·1	29·762	1·90	1·67
June	59·2	29·809	1·74	1·35
July	60·4	29·697	4·41	4·42
August	63·8	29·750	2·22	1·91
September	55·2	29·560	1·52	1·70
October	48·0	29·594	2·25	2·11
November	40·8	29·745	1·45	1·54
December	41·9	29·647	2·55	3·09

Mean monthly temperature—49·6°.

Mean monthly height of the barometer—29·734 inches.

Total rainfall for the year—Museum 22·94 inches; Woodhouse Cliff 22·18 inches.
Average rainfall at the Museum for the ten years 1884-1893—23·53 inches.

Greatest degree of heat, indicated by the thermometer in the shade—87·5° on August 18th; minimum—18° on January 5th.

Greatest barometric pressure—30·53 inches on December 30th, the temperature of the mercury being 47°; least pressure—28·69 inches on December 20th, the temperature of the mercury being 48°.

Greatest fall of rain (during 24 hours)—1·46 inches on July 31st.

The Bench Mark at the corner of the Philosophical Hall is 131·8' above the Ordnance datum, and 8' above the pavement. The cistern of the barometer is 12·8' the thermometers are 42', and the rain-gauge is 45' above the bench mark.

The Hall is situated at 1° 32' 45" or 6 min. 11 sec. W., and 53° 47' 51" N., and hence g/g_{45} is 1·000774. Taking the standard height of the barometer to be 30", and the standard temperature to be 62° F., the height of the homogeneous atmosphere is 27860'. To find the height of a barometer at sea level equivalent to a reading of H'' , at a temperature of t' F. different from 62° F., add to the reading H'' (.0054 \mp .00001 t).

SUNSHINE AT LEEDS IN 1893.

- The observations were made by Jordan's Photographic Sunshine Recorder at the following stations:—
1. The Museum, situate in the centre of the city; elevation above the sea, 137 feet.
 2. Woodhouse Cliff, $1\frac{1}{2}$ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb.
 3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the city.
 4. Union Infirmary, Burmantofts, 1 mile from the centre of the city; elevation, 200 feet; industrial district.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible duration.
JANUARY	1	4'10	1'6
	2	23'50	9'2
	3	44'30	17'1
	4	22'0	8'4
FEBRUARY	1	32'20	11'6
	2	39'50	14'3
	3	54'30	19'6
	4	44'40	16'1
MARCH	1	114'0	31'1
	2	136'10	37'1
	3	158'30	43'2
	4	147'30	40'2
APRIL	1	179'30	43'3
	2	215'35	53'0
	3	238'30	57'1
	4	230'30	56'4
MAY	1	154'20	32'0
	2	175'25	36'3
	3	188'30	39'1
	4	173'0	35'8
JUNE	1	150'35	30'4
	2	166'20	33'6
	3	192'0	36'8
	4	168'50	33'1
JULY	1	136'10	27'4
	2	158'0	31'8
	3	157'40	31'7
	4	155'30	31'3
AUGUST	1	199'40	44'5
	2	122'30	49'6
	3	227'20	50'7
	4	195'20	43'5
SEPTEMBER	1	112'0	29'7
	2	126'50	33'7
	3	138'20	36'7
	4	114'40	30'0
OCTOBER	1	94'0	28'6
	2	108'10	32'9
	3	121'20	37'0
	4	90'50	27'6
NOVEMBER	1	30'40	11'6
	2	39'40	15'0
	3	39'10	14'8
	4	34'30	13'0
DECEMBER	1	16'0	6'6
	2	20'20	8'3
	3	36'10	14'9
	4	16'30	6'8

SUMMARY FOR THE YEAR.

	Hours recorded.		Difference from mean in hours.		Per cent. of possible duration.
Museum ..	1,223 15	..	+341	..	27'4
Woodhouse Cliff ..	1,436 40	..	+316	..	32'2
Lawnswood ..	1,586 30	..	+351	..	35'6
Burmantofts ..	1,393 50	..	+292	..	31'3
31'6 per cent. mean for 1893.					
	27'5	..	..	..	1892.
	22'2	..	..	..	1891.
	24'4	..	..	..	1890.
	20'7	..	..	..	1889.
	19'9	..	..	..	1888.
	28'0	..	..	..	1887.
	24'9	..	..	..	seven years.

The Meteorological Office publishes the following records of sunshine for 1893, as observed at stations taken as representing specified districts:—

	Hours recorded.	Difference from mean.	Percentage of possible duration.
Scotland, N. (Stornoway, &c.) ..	993	—160	23
.. E. (Aberdeen, Marchmont) ..	1,373	+ 23	31
.. W. (Glasgow; Douglas, Isle of Man) ..	1,541	+219	35
England, N.E. (Durham, York) ..	1,558	+318	35
.. N.W. (Stonyhurst, Blackpool, Llandudno) ..	1,499	+192	34
.. Mid. (Cirencester, Oxford, &c.) ..	1,715	+368	39
.. S. (London, Hastings, Southampton, &c.) ..	1,875	+413	43
.. E. (Hillingdon, Goldstone, Cambridge) ..	1,831	+322	42
.. S.W. (Pembroke, Falmouth, Plymouth, &c.) ..	1,964	+378	45
Ireland, N. (Armagh, Markree Castle) ..	1,380	+148	31
.. S. (Dublin, Parsonstown, Valencia) ..	1,532	+ 94	35
Channel Islands (Jersey) ..	2,300	+438	52

SUMMARY.

37.0 per cent. mean for United Kingdom, 1893.
35'2 1892.
32'6 1891.
30'7 1890.
20'2 1880.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Payments for the year 1893-4.

RECEIPTS.			£	s.	d.	PAYMENTS.			£	s.	d.	£	s.	d.
To Balance in hand, May 1st, 1893	...	...	...	...	3	By Repairs and Alterations	...	...	...	16	15	5	...	...
" Balance at Bank	...	...	...	...	17	" Rates and Taxes	...	...	...	4	12	11	...	...
" Annual Subscriptions, viz. :—	...	...	...	...	18	" Fire Insurance	...	...	...	12	10	0	...	...
78 New Proprietary Members, at 21s.	...	...	81	18	0	" Coals, &c.	...	...	...	26	9	9	...	...
2 Original Ordinary	...	...	4	4	0	" Gas	...	...	...	18	11	9	...	...
60 New Ordinary	...	...	63	0	0	" Cleaning	...	...	...	11	17	4	...	...
120 Annual Subscribers, at 21s.	...	...	126	0	0	" Salaries and Wages	...	...	307	5	0	90	17	2
126 Annual Subscribers, at 7s. 6d.	...	...	47	5	0	" Fee to Auditor	...	...	2	2	0	...	...	...
" Arrears	...	...	7	1	0	...	...	...	...	...	...	309	7	0
" Rent, viz. :—	...	...	...	...	329	...	...	...	...	...	...	35	1	1
Cellars	...	...	40	0	0	Collections, Library, and Scientific Apparatus...	...	...	...	...	...	...	...	...
Lecture Room	...	...	186	1	0	" Postages	...	...	9	15	1	...	...	...
Receipts from Visitors to Museum	...	...	...	...	226	" Advertising and Printing	...	...	32	17	7	...	...	...
" Sale of Guides	...	...	3	9	6	" Lectures	...	...	110	9	3	...	...	...
" Bank Interest	...	...	0	15	0	" Sundries	...	...	13	6	4	166	8	3
" Sundries	...	...	4	3	0	" Electric Light Supply	...	...	...	...	...	10	19	8
" Sale of Electric Light Plant, less Commission...	...	...	...	...	8	" Electric Light Installation, renewal and connecting with Main	...	...	...	...	...	36	19	0
" Sale of Share	...	...	...	...	40	" Balance at Bank	...	...	...	...	...	75	13	11
	...	...	...	...	5	" " in hand	...	...	...	...	...	1	17	4
	...	...	...	...	727							727	3	5

I have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.
May 26th, 1894.
 CHAS. BEEVERS,
 CHARTERED ACCOUNTANT.

LIST OF DONATIONS AND ADDITIONS

TO THE
SOCIETY'S MUSEUM AND LIBRARY.

1893-4.

ZOOLOGY.

- | | | |
|---|---|---|
| Case of Birds:—Darter (<i>Plotus</i>); Plan-
tain-eater (<i>Turacus purpureus</i>); Red-
legged Partridge (<i>Caccabis rufa</i>);
Great Spotted Cuckoo (<i>Cuculus</i>
<i>glandarius</i>); &c. | } | Rev. W. Smith, The Vicar-
age, Shadwell. |
| Snowy Owl (<i>Nyctea scandiaca</i>) and
shade | } | Mr. Reginald T. Hadow,
Leeds. |
| Collection of British Reptiles | } | Mr. W. Denison Roebuck,
F.L.S., Leeds. |
| Specimens of <i>Columbella Kitchingi</i> ,
Sowby, Capetown, S. Africa | } | Mr. Langley Kitching, J.P.,
Rosenhurst, Bewdley. |

METALLURGY.

- | | | |
|---|---|---|
| Specimen of Nitro-cyanide of Tita-
nium .. | } | Mr. Ingleby, Leeds (per
Mr. J. Bedford). |
|---|---|---|

- | | | |
|--|---|--------------------------|
| Copy of the Leeds Mercury, Saturday,
June 4th, 1825 | } | Mr. W. H. Settle, Leeds. |
|--|---|--------------------------|

PUBLICATIONS.

- | | | |
|---|---|--|
| Catalogue of Snakes, Vol. I. | } | The Trustees of the British
Museum. |
| Catalogue of Birds, Vols. XXI. & XXII. | | |
| Catalogue of Madreporaria, Vol. I. ... | | |
| Catalogue of Spanish MSS., Vol. IV. | | |
| Catalogue of Romances, Vol. II. | } | Geological Survey of
Canada. |
| Three Plates of Contacts of Rocks ... | | |
| The Great Trigonometrical Survey of
India, Vol. XV., 1893 | } | Secretary of State in
Council of India. |
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THE
SEVENTY-FIFTH REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1894-5.

READ AT THE ANNUAL MEETING, MAY 7th, 1895.

LEEDS:
JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS, 78, ALBION STREET.

1895.

THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY consists of the following Classes of Members and Subscribers :—

- (1.) ORIGINAL PROPRIETARY MEMBERS (holding £100 Shares), who are entitled to personal admission to the Museum, Library, Lectures, and all other Meetings of the Society, and to two transferable tickets to admit visitors to the Lectures. They are exempt from Annual Subscription.
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A list of shares from time to time offered for sale by Members is kept in the office, and information as to price, &c., may be obtained from the Secretary.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members, voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE CLOSE OF THE

SEVENTY-FIFTH SESSION.

During the Seventy-fifth Session of the Society the attendance at the General Meetings has been above the average, and considerable interest has been manifested in several of the subjects discussed.

The thanks of the Society are due to Sir T. Wemyss Reid, Prof. John Goodman, Prof. A. Smithells, and Mr. Edmund Wilson who delivered four interesting lectures gratuitously.

The complete List of Lectures was as follows:—

- 1.—“Co-operation in Nature.” By Prof. CHARLES STEWART, F.I.L.S.
Oct. 16th, 1894.
- 2.—“Experiences among the Smooth and Frizzly-haired Islanders of the Eastern Archipelago.” By HENRY O. FORBES, LL.D., F.R.G.S., F.Z.S. *Nov. 6th, 1894.*
- 3.—“The Art of Biography.” By Sir T. WEMYSS REID, LL.D.
Nov. 13th, 1894.
- 4.—“Henry Fielding.” By A. W. VERRALL, Litt.D. *Nov. 20th, 1894.*
- 5.—“Musical Sands.” By C. CARUS-WILSON, F.G.S. *Dec. 4th, 1894.*
- 6.—“Country Life in the Middle Ages.” By Mrs. J. R. GREEN.
Dec. 18th, 1894.
- 7.—“The Chances of Death.” By Prof. KARL PEARSON, M.A., LL.B.
Jan. 8th, 1895.
- 8.—“Impressionism ; or The Logic of Modern Painting.” By D. S. MACCOLL, M.A. *Jan. 22nd, 1895.*

- 9.—“Constructive Art in Early Egypt, as exemplified in the Pyramids.” By Prof. JOHN GOODMAN, M.I.Mech.E. *Feb. 5th, 1895.*
- 10.—“Protective Artifices among Marine Animals.” By Prof. W. A. HERDMAN, D.Sc., F.R.S., F.L.S. *Feb. 19th, 1895.*
- 11.—“The recent discovery concerning the Composition of the Air.” By Prof. A. SMITHELLS, B.Sc. *March 5th, 1895.*
- 12.—“Slums.” By EDMUND WILSON. *March 19th, 1895.*
- 13.—“Women of Ancient Greece.” By F. B. JEVONS, M.A. *March 26th, 1895.*
- 14.—“Leopardi: a Modern Classic.” By OLIVER ELTON, B.A. *April 2nd, 1895.*

During the Christmas Holidays the Curator gave four Lectures on “Monkeys,” “Birds which cannot fly,” “Injurious Insects,” and “Minerals.” The average attendance was about 120, and marked attention was paid to the specimens from the Museum which were subsequently exhibited.

Miss Simpson delivered six Summer Lectures on Natural History to children, an average attendance of about 100 showed how well her efforts to combine instruction and amusement were appreciated.

The number of Members and Subscribers is:—

	1895	1894
Original Proprietary Members (78 Shares)...	60	62
New Proprietary Members (121 Shares) ...	84	85
Ordinary Members	2	2
New Ordinary Members	68	69
Annual Subscribers of £1 1s.	119	121
Annual Subscribers of 7s. 6d.	122	126
	<hr/> 455	<hr/> 465

25,056 persons have paid for entrance to the Museum during the year.

The Museum has received several additions, some of which are of considerable value. A collection of Carib Celts has been deposited by Rev. T. L. Clemens, of Tobago. A fine

collection of fossils from the Cayton Gill Beds has been presented by Rev. J. S. Tute. Mr. Arthur Motley has given a Maori skull, celt and other objects, and Mr. Wm. Paul the skull of a female Incas Mummy from Chili. Mr. T. W. Pollard has again presented a series of the nests of British birds.

Mr. W. H. Rinder has given a raised Map of Palestine, which was published by the Palestine Exploration Committee, and which has been placed in a glazed frame for exhibition at the top of the staircase. This has awakened a considerable amount of popular interest.

The Society has acquired by purchase a fine series of Permian fossils from Ripley and Durham, and a very perfect specimen of a Glass-rope Sponge (*Hyalonema Sieboldi*).

A continuous record of the changes in the atmospheric pressure is kept by the new Barograph.

Various cases to illustrate the Life-histories of Injurious Insects, and the Transformations of Insects, have been prepared and exhibited and have attracted a considerable amount of attention from visitors. A collection of ethnological objects from New Guinea and China, lent by Mr. Chappell, has been displayed in the Industrial Museum.

Valuable additions to our Library have been received from the Trustees of the British Museum and from the Government of the United States. Mr. Edward Atkinson, F.L.S., Senior Curator in Zoology, has presented nearly forty volumes of the Journal of the Linnean Society.

During the year the Museum was visited twenty-nine times by classes of students in Biology and Geology of the Yorkshire College, and by a large class of University Extension students from Hunslet under the guidance of Mr. Kendall. Sixty-four visits have been paid by specialists, to several of whom extra facilities and assistance have been given. Specimens have been lent on six occasions to the Yorkshire College; on three to University Extension Lecturers; and on three others to the Leeds Naturalists' Society.

Several Subscribers who had formed a class in Geology under the direction of the Home Reading Union, made seven visits to the Library for the purpose of consulting books, besides several to the Museum.

Special regret must be expressed for the loss of one Honorary Member. The Right Rev. James Atlay, D.D., was elected Vicar of Leeds in 1859, and made Bishop of Hereford in 1868. During the whole of his residence in Leeds Dr. Atlay took an active interest in the welfare of the Society, and served upon the Council, for a large part of it he filled the office of Vice-President.

The Council have received with great regret an intimation from Mr. Sydney Lupton of his desire not to be re-appointed to the office of Honorary Secretary. Mr. Lupton has served the Society in this capacity for a period of upwards of nine years, and the Council feel that the most grateful acknowledgments are due to him for his long and zealous services. Mr. Lupton's distinguished scientific attainments, his sound judgment and excellent business capacity have been of the utmost service to the Society.

*Summary of Meteorological Observations taken at the Philosophical Hall,
Leeds, during the year 1894.*

1894.	Mean Temperature.	Mean Height of Barometer (inches).	Total Amount of Rain in inches.	
			Museum.	Woodhouse Cliff.
January	38'1	29'552	2'65	3'39
February	39'9	29'672	4'41	4'66
March	42'3	29'648	1'71	1'75
April	48'6	29'637	3'08	2'83
May	48'0	29'679	1'37	1'35
June	56'3	29'766	2'28	2'52
July	61'5	29'620	2'66	3'39
August	56'6	29'628	2'60	2'39
September	53'0	29'959	'43	'39
October	48'1	29'671	3'87	4'03
November	47'3	29'658	1'45	1'46
December	42'4	29'675	1'49	1'53

Mean monthly temperature—48'5°.

Mean monthly height of the barometer—29'72 inches.

Total rainfall for the year—Museum 28'0 inches; Woodhouse Cliff 29'63 inches.
Average rainfall at the Museum for the ten years 1885-1894—28'03 inches.

Greatest degree of heat, indicated by the thermometer in the shade—85° on June 29th; minimum—11° on January 6th.

Greatest barometric pressure—30'49 inches on January 3rd, the temperature of the mercury being 42°; least pressure—28'66 inches on December 28th, the temperature of the mercury being 48°.

Greatest fall of rain (during 24 hours)—1'02 inches on October 20th.

The Bench Mark at the corner of the Philosophical Hall is 131'8' above the Ordnance datum, and '8' above the pavement. The cistern of the barometer is 12'8', the thermometers are 42', and the rain-gauge is 45' above the bench mark.

The Hall is situated at 1° 32' 45" or 6 min. 11 sec. W., and 53° 47' 51" N., and hence g/g₄₅ is 1'000774. Taking the standard height of the barometer to be 30", and the standard temperature to be 62° F., the height of the homogeneous atmosphere is 27860'. To find the height of a barometer at sea level equivalent to a reading of H", at a temperature of t° F., different from 62° F., add to the reading H" (.0054 + .00001t).

1. The Museum, situate in the centre of the city; elevation above the sea, 145 feet.
2. Woodhouse Cliff, 1½ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the city.
4. Union Infirmary, Burnmantofts, 1 mile from the centre of the city; elevation, 200 feet; industrial district.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible duration.
JANUARY	1	39'40	15'3
	2	46'55	18'1
	3	56'10	21'6
	4	31'15	12'0
FEBRUARY	1	53'30	19'2
	2	67'50	24'3
	3	76'20	27'4
	4	56'10	20'0
MARCH	1	175'30	47'8
	2	185'20	50'5
	3	189'40	51'7
	4	172'40	47'0
APRIL	1	111'25	26'8
	2	131'30	31'6
	3	136'10	32'8
	4	131'50	31'7
MAY	1	103'40	33'9
	2	183'0	37'9
	3	201'30	41'7
	4	132'20	37'7
JUNE	1	140'30	28'4
	2	147'20	29'8
	3	157'30	31'8
	4	153'40	31'0
JULY	1	166'40	33'5
	2	181'10	36'4
	3	194'30	39'1
	4	181'50	36'6
AUGUST	1	112'30	25'2
	2	125'0	28'1
	3	130'10	29'2
	4	120'0	26'9
SEPTEMBER	1	104'10	27'6
	2	118'50	31'5
	3	121'0	32'1
	4	117'40	31'2
OCTOBER	1	46'50	14'2
	2	46'50	14'2
	3	55'40	16'9
	4	56'20	17'1
NOVEMBER	1	35'0	13'2
	2	42'40	16'0
	3	50'0	18'9
	4	38'30	14'5
DECEMBER	1	25'30	10'5
	2	36'20	14'9
	3	46'30	19'1
	4	34'0	14'0

SUMMARY FOR THE YEAR

	Hours recorded.	Hours. M.	Difference from mean of 7 years in hours.	Per cent. of possible duration.
Museum ..	1,174	55	+250'58	26'3
Woodhouse Cliff ..	1,312	45	+165'42	29'4
Lawnswood ..	1,415	10	+153'61	31'7
Burnmantofts ..	1,276	15	+149'38	28'6
29'0 per cent. mean for 1894.			20'7	per cent. mean for 1889.
31'6		1893.	10'9	1888.
27'5		1892.	28'0	1887.
22'2		1891.	25'3	eight years.
24'4		1890.		

The Meteorological Office publishes the following records of sunshine for 1894, as observed at stations taken as representing specified districts:—

	Hours recorded.	Difference from mean.	Percentage of possible duration.
Scotland, N. (Stornoway, &c.)	1,129	+117	30
" E. (Aberdeen, Marchmont)	1,296	+64	33
" W. (Glasgow; Douglas, Isle of Man) ..	1,354	+43	31
England, N.E. (Durham, York)	1,305	+91	30
" N.W. (Stonyhurst, Blackpool, Llandudno)	1,230	+57	31
" Mid. (Cirencester, Oxford, &c.)	1,325	— 1	30
" S. (London, Hastings, Southampton, &c.)	1,579	— 16	34
" E. (Hillingdon, Geldstone, Cambridge)	1,439	— 43	33
" S.W. (Pembroke, Falmouth, Plymouth, &c.)	1,610	— 8	36
Ireland, N. (Armagh, Markree Castle) ..	1,262	+55	29
" S. (Dublin, Parsonstown, Valencia) ..	1,366	— 74	31
Channel Islands (Jersey)	1,763	— 63	41

SUMMARY.

31'1 per cent. mean for United Kingdom, 1894.	29'2 per cent. mean for United Kingdom, 1889.
37'0	27'5
35'2	35'6
32'6	32'3
30'7	1890.

At the above stations 2,883 hours less sunshine were recorded in 1894 than in 1893.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Payments for the year 1894-5.

RECEIPTS.			£	s.	d.	PAYMENTS.			£	s.	d.	£	s.	d.
To Balance in hand, May 1st, 1894	1 17 4	By Repairs and Alterations	...	...	...	...	62 6 7	...	...	...
" Balance at Bank do.	75 13 11	" Rates and Taxes	...	...	...	...	4 11 1	...	...	...
" Annual Subscriptions, viz.:	" Fire Insurance	...	...	...	...	12 10 0	...	...	...
76 New Proprietary Members, at 21s.	79 16 0	" Coals, &c.	...	...	...	...	22 16 7	...	...	...
2 Original Ordinary	4 4 0	" Gas	...	...	...	...	20 15 7	...	...	...
61 New Ordinary	64 1 0	" Cleaning	...	...	...	...	8 1 0	...	...	...
126 Annual Subscribers, at 21s.	132 6 0	" Salaries and Wages	...	...	...	...	...	131 0 10	...	...
122 Annual Subscribers, at 7s. 6d.	45 15 0	" Fee to Auditor	...	...	...	...	306 11 0	...	...	...
" Arrears	5 5 0		...	...	...	...	2 2 0	...	...	...
Rent, viz.:	331 7 0	Collections, Library, and Scientific Apparatus	...	...	...	...	...	308 13 0	...	...
Cellars	40 0 0	" Postages	...	...	...	...	8 14 2	...	...	...
Lecture Room	109 10 0	" Advertising and Printing	...	...	...	...	34 8 9	...	...	...
Receipts from Visitors to Museum	209 10 0	" Lectures	...	...	...	...	121 12 8	...	...	...
" Sale of Guides	104 8 0	" Sundries	...	...	...	...	18 14 3	...	...	...
" Bank Interest	4 1 11	" Electric Light Supply	...	...	...	...	...	183 9 10	...	...
" Sundries	1 5 0	" Law Expenses	...	...	...	...	...	4 14 1	...	...
	5 14 0	" Balance at Bank	...	...	...	...	...	14 15 8	...	...
	" " in hand	...	...	...	...	...	44 14 0	...	...
	11 0 11		...	...	...	...	...	0 19 0	...	...
<u>£733 17 2</u>						<u>£733 17 2</u>								

I have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.
May 15th, 1895.

CHAS. BECKETTS,
CHARTERED ACCOUNTANT.

LIST OF DONATIONS AND ADDITIONS

TO THE
SOCIETY'S MUSEUM AND LIBRARY.

1894-5.

ZOOLOGY.

A small Collection of Birds' Nests and Eggs	Mr. T. W. Pollard, Kirkby-
Specimen of Glass-rope Sponge (<i>Hyalonema Sieboldi</i>)	Malzeard.
Living Slow-worm	Purchased.
Two living Palmated Newts	Mr. W. Denison Roebuck.,
Stuffed Specimen of Golden Pheasant (<i>Thaumalea picta</i>) L., var. Lady Amherst	F.L.S., Leeds.
	Mr. J. T. Pollard, Leeds.

BOTANY.

Edible Morel (<i>Morchella esculenta</i>), Scriven Park; Starry Puff-ball (<i>Geaster rufescens</i>), Scriven Park, and <i>Polyporus</i> , Walkingham	Mr. Geo. Paul, F.R.Met.S., Ripley.
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PALÆONTOLOGY.

Collection of Permian Fossils	Purchased.
Collection of Fossils from the Cayton Gill Bed (Millstone Grit), made by the donor in the neighbourhood of Ripley	The Rev. J. Stanley Tute, B.A., Markington.

GEOLOGY.

Mud and silicious deposits, and portion of White Terrace, Rotomahana, New Zealand	Mr. Arthur Motley, New Zealand.
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MINERALOGY.

Specimens of Plumbago in Granite, &c., Norway	Mr. J. W. Addyman, B.A., Leeds.
Native Sulphur, Rotoma, New Zealand	Mr. Arthur Motley, New Zealand.

ETHNOLOGY.

Mummy-head of Incas woman, Junin, Chili	Mr. Wm. Paul, Chapel-Allerton,
Maori-skull, Wairarapa Plains, New Zealand.....	Mr. Arthur Motley, New Zealand.

ARCHÆOLOGY.

Celt found when digging in an old Maori pah or village, Wanganin, New Zealand	Mr. Arthur Motley, New Zealand.
Two Silver Coins found on the site of a Roman Church, on demolition, Tachaneza, near Poniasuski, Poland	Mrs. Veevers, Claremont House, Headingley.

PHOTOGRAPHY.

Four framed enlargements of Photographs of the surface of the Moon, taken at Lick Observatory	Mr. Sydney Lupton, M.A., Roundhay.
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GEOGRAPHY.

Large Raised Map of Palestine, published by the Palestine Exploration Committee	Mr. W. H. Rinder, F.R.G.S., Chapeltown.
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PUBLICATIONS.

Catalogue of Snakes, Vol. II.	The Trustees of the British Museum.
Catalogue of Birds, Vol. XXIII.	
Catalogue of the Mycetozoa	
Catalogue of the Fossil Plants of the Wealden, Part I.	
Catalogue of British Lichens, Part I.	The Author.
Some Recent Evidence in favour of Impact (pamphlet), by Prof. A. W. Bickerton, Sydney	
Catalogue of the Leeds Public Library	The Public Librarian, Mr. James Yates.
Poetical Works of Constance Naden	Lt.-Col. R. Lewins, M.D.
Life and Mind	
Roman Inscriptions in Britain, II., 1894	Mr. F. Haverfield, Oxford.
Fauna der Gaskohle, Band III., Heft 3	Purchased.
The Hidden Pyramid	Mr. J. J. Ward, Leeds.

PERIODICALS.

WEEKLY.

Nature Purchased.

BI-WEEKLY.

Bollettino delle Pubblicazioni Italiane The Compiler.

MONTHLY.

Annals and Magazine of Natural
History } Purchased.

Geological Magazine Purchased.

Journal of the Chemical Society The Society.

Monthly Notices of the Royal Astro-
nomical Society } The Society.

Philosophical Magazine and Journal
of Science } Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical
Society } The Society.

QUARTERLY.

Quarterly Journal of Microscopical
Science } Purchased.

Quarterly Journal of Geological Society The Society.

Quarterly Returns of Marriages,
Births, and Deaths } Registrar-General.

Journal of the Anthropological
Institute } The Institute.

Zeitschrift für Wissenschaftliche Zoo-
logie } Purchased.

Journal of the Linnean Society { Mr. Edward Atkinson,
F.L.S.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions Purchased.

Proceedings of the Royal Society ... The Society.

Proceedings of the Royal Institution
of Great Britain } The Institution.

Publications of the Ray Society, Vol.
VI., Part III., 1893 } Purchased.

British Association Report The Association

Greenwich Observations.....	
Greenwich five-year Catalogue of 258 Stars, 1890	The Astronomer-Royal.
Cape Heliometer Observations, 1881-1883	
Memoirs of the Royal Astronomical Society	The Society.
Radcliffe Astronomical and Meteorological Observations	Radcliffe Trustees.
Symons's British Rainfall, 1893	Purchased.
Monographs of the Palaeontographical Society, Vol. XLVIII.	Purchased.
Proceedings of the Geologists' Association	The Association.
Proceedings of the Yorkshire Geological and Polytechnic Society, Vol. XII. Part IV., Vol. X. (bound) and 17 back numbers towards completion of set.....	The Society.
Transactions of the Leeds Geological Association	The Association.
Proceedings of the Liverpool Geological Society.....	The Society.
Journal of the Liverpool Geological Association	The Association.
Transactions of the Manchester Geological Society	The Society.
Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne.....	The Tyneside Naturalists' Field Club.
Proceedings of the Birmingham Philosophical Society	The Society.
Report of the Bradford Philosophical Society	The Society.
Annual Report of the Yorkshire Philosophical Society	The Society.
Report of the Halifax Literary and Philosophical Society	The Society.
Transactions of the Leicester Literary and Philosophical Society, 1894 ...	The Society.
Report of the Committee of Leicester Town Museum	The Museum.

Annual Report of the Brighton Town Museum	} The Museum.
Annual Report, Middlesex Hospital...	} The Hospital.
Annual Report of the Birkenhead Literary and Scientific Society	} The Society.
Proceedings of the Liverpool Literary and Philosophical Society	} The Society.
Annual Report and Proceedings of the Liverpool Science Students' Association	} The Association.
Memoirs and Proceedings of the Man- chester Literary and Philosophical Society	} The Society.
Annual Report of the Sheffield Literary and Philosophical Society	} The Society.
Annual Report of the Chester Society of Natural Science and Literature	} The Society.
Transactions of the Leeds Naturalists' Club and Scientific Association.....	} The Association.
Report of the Manchester Museum, Owens College.....	} The Curator.
Journal of the Royal Institution of Cornwall	} The Institution.
Annual Report of the Royal Cornwall Polytechnic Society, 1893	} The Society.
Report of Associated Architectural Societies	} The Society.
Journal of the Chester Archæological and Historic Society	} The Society.
Geological Record	} Purchased.
Transactions of the Yorkshire Natural- ists' Union ..	} The Union.
Proceedings of the Royal Society of Edinburgh	} The Society.
Transactions do. do.	} do. do.
Transactions of the Edinburgh Geo- logical Society.....	} The Society.
Proceedings of the Glasgow Philoso- phical Society, 1893-4	} The Society.
Proceedings of the Berwickshire Naturalists' Club	} The Club.

Scientific Proceedings of the Royal Dublin Society.....	} The Society.
Scientific Transactions do.	
Transactions of the Royal Irish Academy	} The Academy.
Proceedings do. do.	
Journal of the Royal Geological Society of Ireland	} The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club, 1893-4	
Publications of the Royal Swedish Academy of Sciences.....	} The Academy.
Papers of the Royal University of Norway	
Bulletin of the Geological Institution of the University of Upsala, 1892-3	} The Institution.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhand- linger.....	
Bulletin Société Impériale, Moscow ...	} The Society.
"Leopoldina" Amtliches organ der Kaiserlichen, Leopoldino-Carolini- schen Deutschen Akademie der Naturforscher	
Memoires de la Société d'émulation d'Abbeville	} The Society.
Mittheilungen der Kais. Königl. Geo- graphischen Gesellschaft in Wien ...	
Memoirs of the National Academy of Sciences	} The Academy.
Report of Australasian Association for the Adv. of Science, Vol.V.	
Journal and Proceedings of the Royal Society of New South Wales	} The Society.
Wealth and Progress of New South Wales, 1893	
Records of the Geological Survey of N.S.W., Vol. IV.	} The Surveyor.
Memoirs of the Geological Survey of N.S.W.	

Annual Report and Papers of the Department of Mines and Agriculture, N.S.W., 1893	The Department.
Transactions and Proceedings of the Royal Geographical Society of Australasia (N.S.W. Branch).....	The Society.
Prodromus of the Zoology of Victoria	The Editor.
Records of the Australian Museum	The Trustees.
Report of the Trustees of the Australian Museum.....	
Proceedings of the Royal Society of Queensland	The Society.
Transactions and Proceedings of the New Zealand Institute	The Institute.
Papers and Proceedings of the Royal Society of Tasmania	The Society.
Proceedings and Transactions of the Royal Society of Canada, Vol. XI., 1893	The Society.
Proceedings of the Canadian Institute	The Institute.
Annual Report do.	
Transactions do.	
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	The Institute.
Annual Report (6th) Hamilton Public Library, Ontario, Canada	The Librarian.
Journal and Proceedings of the Hamil- ton Association	The Association.
Geological and Natural History Survey of Canada	Department of the Interior.
Annual Report and Papers—do.	
Contributions to Canadian Palæon- tology	
Memorias de la Sociedad Científica (Mexico)	
“ Boletín Mensual ” Observatorio Meteorológico-Magnético, Central de Mexico	The Editor.
Anuario del Observatorio Astron- ómico Nacional, Mexico.....	The Astronomer.
Boletín del Observatorio Astronómico Nacional de Tacubaya	The Observer.

Report of the Muséum National, Rio-de-Janeiro.....	} Directeur Général.
Archivos do.	
Cape Meridian Observations	} Cape Astronomer-Royal.
Annals of the Cape Observatory	
Report of H.M. Astronomer at the Cape of Good Hope to the Secretary of Admiralty, 1889-92 and 1893 ...	
Transactions of the American Philo- sophical Society	} The Society.
Proceedings do.	
United States Geological Survey, 12th Annual Report, Parts I., II., and III. 13th do. Part I.	} The Department.
Contributions to American Ethnology. United States Geographical and Geo- logical Survey, Vol. IX.	
United States Department of Agricul- ture, Publications of	} The Department.
Report of the Smithsonian Institution, 1892	
Smithsonian Miscellaneous Collections Smithsonian Contributions	} The Institution.
Annual Reports of the Bureau of Ethnology, 1889-90 and 1890-91...	
Miscellaneous Publications of the Bureau of Ethnology	
Bibliography of the Wakashan Lan- guages	
The Pamunkey Indians of Virginia ...	
The Maya Year	
An Ancient Quarry in Indian Ter- ritory.....	
Proceedings of United States National Museum	} The Museum.
Report do. do.	
Bulletins do. do.	} The Academy.
Transactions of the Academy of Science of St. Louis	
Proceedings of the Academy of Natural Sciences of Philadelphia...	} The Academy.
Papers do. do.	
Proceedings of the American Academy of Arts and Sciences, New Series, 1893-94.....	} The Academy.

Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	The Academy.
Memoirs of the National Academy of Sciences, Washington.....	The Academy.
Proceedings of the Davenport Academy of Natural Science.....	The Academy.
Transactions of the Wagner Free Institute of Science, Philadelphia ...	The Institute.
Annual Report, Transactions, and Miscellaneous Papers of the Historical and Scientific Society of Manitoba	The Society.
Annual Report of the Trustees of the Cooper Union for the Advancement of Science	The Union.
Proceedings of the Boston Society of Natural History, U.S.A., Vol. XXVI., Parts II. and III.....	The Society.
Memoirs do.	
Geology of the Boston Basin, Vol. I., Part II.....	The Institute.
Bulletins of the Essex Institute, U.S.A.	
Annual Report of the Curator of the Museum of Comparative Anatomy, Harvard College	The College.
Annual Report of Harvard College, 1893-4	
Harvard University Catalogue	The University.
Transactions of the Astronomical Observatory of Yale University ...	The University.
Annual Report do.	
Report of the President of Yale University	
Catalogue ditto ditto	
Journal of the Elisha Mitchell Scientific Society, 1894, Part II....	The Society.
Tufts College Studies.....	The College.
Transactions of the Meriden Scientific Association	The Association.

LIST OF OFFICERS AND COUNCIL,

1895-6.

OFFICERS.

PRESIDENT	REV. CHAS. HARGROVE, M.A.
VICE-PRESIDENTS.	{ NATHAN BODINGTON, M.A. SYDNEY LUPTON, M.A.
HONORARY SECRETARIES	{ ARTHUR SMITHELLS, B.Sc. E. KITSON CLARK, M.A.
TREASURER	JAMES W. OXLEY.
HONORARY CURATOR IN GEOLOGY	{ J. A. NUNNELEY, M.B.
HONORARY CURATORS IN ZOOLOGY	{ EDWARD ATKINSON, F.L.S. LOUIS C. MIALI, F.R.S.
HONORARY CURATOR IN ETHNOLOGY AND WORKS OF ART	{ J. E. EDDISON, M.D.
HONORARY LIBRARIAN	REV. J. H. D. MATTHEWS, M.A.

The above officers, with the following gentlemen, form the
COUNCIL.

TALBOT BAINES, B.A.	T. P. TEALE, M.A., F.R.S.
T. WALTER HARDING.	J. H. WICKSTEED, M.Inst.C.E.
THOMAS MARSHALL, M.A.	J. J. WILLSON.
RICHARD REYNOLDS, F.I.C.	EDMUND WILSON.
THOMAS SCATTERGOOD.	RICHARD WILSON.

Secretary	W. F. HUSBAND, LL.B.
Curator	HENRY CROWTHER, F.R.M.S.

LIST OF MEMBERS AND SUBSCRIBERS,

1895-6.

** Members deceased, whose shares have not been transferred.*

PROPRIETARY MEMBERS, EXEMPT FROM ANNUAL SUBSCRIPTIONS.

2	* Aldam, Wm.	:	
3	Armitage, Robert	.	Farnley.
4	Arthington, Robert	.	Headingley.
49	Baines, Mrs. Arthur	.	The Heath, Adel.
5	Baines, Herbert S.	.	Cromer Hall, Leeds.
63	Barr, Frederick Horatio	.	North Grange Road, Headingley.
6	Barran, Sir John, Bart., M.P.	.	Chapel-Allerton Hall.
20	Battye, John	.	Birstal.
22, 24	* Beckett, W., M.P. (2 shares)	.	
18	Bilbrough, Alfred	.	15, Beech Grove Terrace.
8	Binks, Benj., Junr.	.	5, Park Place.
45	Braithwaite, James, M.D.	.	Clarendon Road.
9	Broadhead, Wm. Henry	.	Broomfield Crescent, Headingley.
11	* Brown, James	.	
31, 62	Brown, Wm. J. (2 shares)	.	The Mount, Ackworth.
13, 14	Calverley, Edmd. (2 shares)	.	Oulton Hall.
15	Charlesworth, C. H.	.	Settle.
16	Chorley, Mrs.	.	9, Cavendish Road.
19	Close, James William	.	32, Park Row.
21	Cudworth, John W.	.	43, Mount Preston.
23	Dibb, Mrs. Elizabeth	.	
25	Eddison, John Edwin, M.D.	.	6, Park Square.
26	* Ellershaw, John	.	
28	Empson, Christopher	.	Mill Mount, York.
29, 48	Ford, J. R. (2 shares)	.	Quarry Dene, Weetwood.
33	Goodman, Benjamin	.	Gledhow House.
36-8	Gott, Wm. Henry (3 shares)	.	

- 73 *Teale, Mrs. .
 74 Tottie, Mrs. John William
 34, 35 Truro, The Bishop of (2 shares) Trenythron, Par Station.
 54 Waite, James Butler . Belvidere, Newton Road.
 75 Walker, Edward . 32, Springfield Mount.
 17 Walker, Reginald Thomas 1, Furnival's Inn, Holborn,
 London, E.C.
 76 Ward, William . 12, Bank Street.
 12 Wilson, Rev. Benjamin . Christ Church Vicarage, Mirfield.
 78 Wilson, Edmund . Denison Hall.
 1 Wurtzburg, John Henry . 2, De Grey Road.

NEW PROPRIETARY MEMBERS,

WITH AN ANNUAL SUBSCRIPTION OF ONE GUINEA.

- 32 Atkinson, Edward, F.L.S. . Langholme, Franklin Road, .
 Harrogate.
 113 Bailes, Richard . Ridge Villa, Meanwood Road.
 116 *Baines, Frederick .
 2 Balme, E. B. Wheatley, M.A. Cote Wall, Mirfield.
 62 Barley, D. H., M.D. . Grove House, Burmantofts.
 91 Bedford, James . Woodhouse Cliff.
 15 Bilbrough, Wm. Radford . 15, Beech Grove Terrace.
 3 Birchall, Edward . Inglemoor House, Moorland Rd.
 121 Blackburn, Henry G. . 2, East Parade.
 13 Boothman, David . Rough House, Headingley.
 4 Boothroyd, William . Grove Mill, Headingley.
 10 Bowling, John . Newstead House, Spencer Place.
 49 Braithwaite, William . Throstle Nest, Horsforth.
 5, 6 Brown, G. W. (2 shares) . 78, Belsize Park Gardens,
 Hampstead, London.
 89 Buckton, Joshua . Meanwood.
 1 Burrell, Benjamin A. . 5, Mount Preston.
 86 Carter, J. B. . Elm House, Potternewton.
 9 *Chadwick, William
 14 Conyers, W. H. . The Hills, Ilkley.
 45 Craven, John . 3, Beech Grove Terrace.
 104 Crawford, John William . Newton Lane.

26	Dawson, Oswald	Albion Walk Chambers, Leeds.
19	Fairbairn, Sir Andrew	Askham Grange, near York.
118	Flitch, John R.	Chapel-Allerton.
52	Fraser, Mrs. James B.	Claremont, Horsforth.
102-3 106-10 114-15	Gott, William Henry (P) (9 shares)	
22	Hargrave, Charles	St. Agnesgate House, Ripon.
23	*Hargrave, James	
7	Hargrove, Rev. C., M.A.	10, De Grey Terrace.
16	Harvey, William	Heathfield, Ilkley.
81	Hatch, S. C.	Church Cottage, Bexley, Kent.
44	Hepper, Mrs. J. H.	Suffolk Lodge, Harrogate.
51	Hoggard, Alfred	25, Cavendish Road.
98	Howgate, William	21, Blenheim Terrace.
36	*Hudson, Henry	
84	Hummel, Prof. J. J.	152, Woodsley Road.
120	Ingham, Samuel	Headingley Hall.
96	Jepson, Edward George	20, Springfield Mount.
39	Jowitt, Robert Benson	Harehills, Leeds.
40	Joy, William Lomas	Brentwood, Beverley.
43	*Kitson, James	
46	Kitson, J. Hawthorn	Elmete Hall, Roundhay.
47	Kitson, Sir Jas., Bart., M.P.	Gledhow Hall.
48	Kitson, Mrs. F. W.	Burley Hill, Leeds.
90	Lawson, Frederick W.	Woodfield, Wood Lane.
50	Leather, Ernest Arthur	Birstwith Hall, Ripley.
53	Lupton, Mrs. Arthur	Headingley.
95	Lupton, Arthur G.	Wellington Street.
8	Lupton, Henry	Lyndhurst, Headingley.
54	*Lupton, Joseph	
55	Lupton, Mrs. John	Moorlands, Headingley.
21	Lupton, Oliver	Shireoak Road, Headingley.
56	Lupton, William Walter	The Grove, Roundhay.
63, 99, 100	Lupton, Fras. Martineau, M.A. (P) (3 shares)	Rockland, Newton Park.

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|-----|----------------------------|---|-----------------------------------|
| 88 | McGuire, Thomas | . | Grosvenor Villa, Grosvenor Rd. |
| 94 | Malcolm, John Cooper | . | Brighton Villa, New Leeds. |
| 25 | Marsden, Mrs. H. R. | . | Regent Villas, Cumberland Road. |
| 60 | Marshall, Thomas, M.A. | . | Highfield, Chapel-Allerton. |
| 24 | Matthews, Rev. J. H. D. | . | Grammar School, Leeds. |
| 27 | Maude, William Henry | . | Middleton Lodge, Leeds. |
| 117 | Middleton, Arthur | . | Calverley Chambers, Victoria Sq. |
| 34 | Muir, Prof. James | . | 3, Hillary Place. |
| 66 | Nicholson, A. H. | . | |
| 30 | Nicholson, Marshall | . | Middleton Hall, near Leeds. |
| 64 | *Nickols, Richard | . | |
| 67 | Nunneley, A. G. | . | Wanstead House, Burley, Leeds. |
| 68 | Oxley, James Walker | . | 28, Commercial Street. |
| 93 | Palmer, Henry John | . | 55, Albion Street. |
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THE
SEVENTY-SIXTH REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1893-6.

READ AT THE ANNUAL MEETING, MAY 5th, 1896.

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JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS, 78, ALBION STREET.
—
1896.

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AT THE CLOSE OF THE

SEVENTY-SIXTH SESSION.

During the past Session the Society has held fourteen General Meetings, which have on the whole been well attended. The innovation of having a lecture delivered in a foreign language proved very acceptable to the members, and the thanks of the Society are due to M. du Gillon for his interesting lecture. The Society is also indebted to the President, Prof. E. C. Clark, Mr. Orrock, Mr. Thomas Marshall, and Dr. Cohen for valuable lectures delivered gratuitously.

The List of Lectures is as follows :—

- 1.—“The Making of a Chinaman.” By Rev. W. T. A. BARBER, M.A.
Nov. 5th, 1895.
- 2.—“A New Race in Egypt.” By Prof. W. M. FLINDERS PETRIE,
D.C.L., LL.D. *Nov. 12th, 1895.*
- 3.—“The Homeric Woman.” By THOMAS MARSHALL, M.A. *Dec. 3rd,*
1895.
- 4.—“British Expansion in Africa.” By Capt. F. D. LUGARD, C.B.,
D.S.O. *Dec. 10th, 1895.*
- 5.—“Present University Education.” By Prof. E. C. CLARK, LL.D.
Dec. 17th, 1895.
- 6.—“The New Gases.” By Prof. WILLIAM RAMSAY, Ph.D., F.R.S.
Jan. 7th, 1896.
- 7.—“The Ghetto.” By I. ZANGWILL. *Jan. 21st, 1896.*

- 8.—“Molière, and his *Bourgeois Gentilhomme*.” By P. H. M. du GILLON.
Feb. 4th, 1896.
- 9.—“Warning and Signalling amongst Animals.” By Prof. EDWARD B.
POULTON, M.A., F.R.S. *Feb. 18th, 1896.*
- 10.—“John Constable”; illustrated by pictures by the Master. By
JAMES ORROCK. *Feb. 25th, 1896.*
- 11.—“The Character and Extent of Air Pollution in Leeds.” By JULIUS
B. COHEN, Ph.D. *March 3rd, 1896.*
- 12.—“History of Mythological Animals in Norman Sculptures.” By
H. CLIFTON SORBY, LL.D., F.R.S. *March 17th, 1896.*
- 13.—“Mount Athos and the Monks.” By Rev. Prof. J. P. MAHAFFY,
D.D. *April 14th, 1896.*
- 14.—“A *Mappa Mundi* of the 13th Century (with *fac-simile* and lantern
illustrations).” By Rev. C. HARGROVE, M.A. *April 21st, 1896.*

In addition to the above meetings, a Special Meeting was held under the joint auspices of the Society and of the Chamber of Commerce on Oct. 15th, 1895, when Mr. A. R. Colquhoun gave a lecture on “The Nicaragua Canal.”

During the Christmas Holidays the Curator gave three lectures on “Aquatic Beasts,” “Birds’ Nests and Eggs,” and “How Fossils tell the Earth’s History.” The lectures were attended by an average of about 150 persons, most of whom remained after the lecture to be present at the demonstration on objects from the Society’s collections, illustrative of the topics which had been dealt with.

During the Winter six Afternoon Lectures were delivered in the Museum by Mr. Edward Atkinson, one of the Honorary Curators in Zoology, on the Palestine Map, presented to the Society last year by Mr. W. H. Rinder, who kindly defrayed all expenses incidental to the lectures.

The number of Members and Subscribers is :—

	1896	1895
Original Proprietary Members (78 Shares)...	60	60
New Proprietary Members (121 Shares) ...	82	84
Ordinary Members	2	2
New Ordinary Members	66	68
Annual Subscribers of £1 1s.	120	119
Annual Subscribers of 7s. 6d.	111	122
	<hr/>	<hr/>
	441	455
	<hr/>	<hr/>

24,476 persons have paid for entrance to the Museum during the year.

In accordance with the recommendations of the Museum Committee extensive alterations have been made in the arrangement of the Museum. The West Gallery of the large Zoological Room is now devoted to the display of certain groups of invertebrate animals, to accommodate which table-cases have been fitted on the floor, and flat cases on the wall spaces. In front of the principals of the roof, a series of cases has been fixed for the exhibition of the examples of the "Life Histories of Injurious Insects." The Bird Room has been so arranged that in it are displayed only such objects as pertain to this class of animal. The Mineral Cases have been placed in the South Geological Room, and there has been a general rearrangement of the cases on the floor of the large Zoological Room. The columns of basalt, from the Giant's Causeway, have been moved to the Outer Vestibule, and the large specimens of fossil coal plants to the Inner Vestibule. The wall-cases in which were contained an exceedingly valuable selection of Stone and Metal Implements, Metal Work and Pottery, in a bad light in the Inner Vestibule, have been removed and fixed round the Staircase-landing where the lighting is excellent.

The lighting of the Museum has been greatly improved by a thorough cleaning of the outside of the glass roof.

The Museum continues to be well used by students, and to them help has been given whenever practicable. Specimens have been lent to the Departments of Biology and Geology of the Yorkshire College; Mr. Kendall, as in previous years, has brought classes of University Extension and Geological students, and other undergraduates of the Victoria University have been allowed to handle specimens, and to refer to the literature on the subjects of study. There have been eight visits from Board Schools, and seventy by specialists desirous of examining the cabinet collections. Permission, too, has been given to an increasing number of students to sketch antiquarian and natural history objects.

Professor Petrie has given a new reading from the coffin of the mummy in the Outer Vestibule, according to which it is that of Nesi Amen, of the date of Amenhotep III., 1400, B.C. The Mummy is probably of a later date, as the labels or straps on it are those of Rameses XII., 1070, B.C.

Several fresh cases of Injurious Insects have been added to the series in the West Gallery.

The display of the transformations of living insects has been unusually good this year, as opportunities were afforded to collect plentifully occurring, and hardy forms, at Knaresbro'. Small aquaria, in which were living examples of coleoptera, hemiptera, mollusca, and in which the development of such amphibia as frogs and newts could be followed, attracted considerable attention.

The donations to the Museum by bequests and gifts have been numerous and valuable, and include a series of Guillemot Eggs and other natural history objects from Mr. H. Bendelack Hewetson, F.L.S., F.Z.S.; Roman antiquities in terra cotta and glass from Rio Tinto, Spain; and sections of wooden water-pipes formerly used in Liverpool, bequeathed by the late Mr. Robt. H. Wood, Headingley. An interesting series of Indian stone arrowheads and scrapers, collected by Mr. E. Jacques, in Alberta, N.W. Canada, and presented by Mr. Edward Atkinson, F.L.S.

A bust of Mr. George Walker, of Killingbeck, author of "The Costume of Yorkshire," modelled by Mr. Thomas Earle, and exhibited at the Royal Academy in 1850, by bequest from the late Mrs. Read, Headingley. A large collection of minerals and oolitic fossils from Mrs. Morley, of Chapel-Allerton. Specimens of molluscs, vermes, crustaceans, and carboniferous fossils from Mr. H. B. Wilson, Armley, and a cabinet and a small series of minerals by Mr. William Ward, Leeds.

Prof. Flinders Petrie has presented a very valuable selection of the alabaster and baked-clay vessels which were used by the "New Race," and which he discovered buried in the older river gravels of the Nile, on the edge of the Libyan desert, between the small towns of Ballas and Nagada. Your Council feel grateful to Prof. Petrie for enabling them to place on permanent exhibition in its Museum objects of such world-wide interest.

The Library has been enriched by a bequest of valuable scientific books, by the late Mr. R. W. Morley, of Chapel-Allerton. Mr. Edward Atkinson has presented the parts of the Journal of the Linnean Society as published, and the gifts of the Trustees of the British Museum, and of the Government of the United States have been numerous. The Council have to thank many kindred societies for their kind help in this respect.

The continuous records of atmospheric changes made with the barograph, on view in one of the windows of the Museum, excite much public interest. On the 9th of January, this year, when the barometric pressure reached the highest point recorded in Britain (31.119 inches in Glasgow), the corrected reading at the Museum was 30.976 inches.

The Council have to record, with regret, the death of Mr. Henry Seebohm, F.L.S., F.Z.S., an Honorary Member of the Society, and one of the most distinguished of British Ornithologists. Mr. Seebohm was a native of Bradford, and for many years a manufacturer of steel at Rotherham. Birds were his

favourite study from an early age, and to increase his collections he made adventurous journeys into Siberia and other distant countries. His "History of British Birds and their Eggs," and his "Geographical Distribution of Plovers, Sandpipers, and Snipes," made him widely known to naturalists. His collections, which were large and valuable, were given or bequeathed to the British Museum.

At the instance of the Council a public meeting was held in the Philosophical Hall, on April 24th, with the object of promoting the national memorial which is being raised to the late Professor Huxley. The meeting was addressed by the Bishop of Ripon, and a short account of Professor Huxley's life-work was read by Professor Miall. A Committee (of which the Mayor of Leeds will act as Chairman), consisting of the members of the Council and other gentlemen interested in the movement was constituted, and it is hoped that a substantial sum of money may be collected from members of the Society and residents in Leeds and the neighbourhood.

*Summary of Meteorological Observations taken at the Philosophical Hall,
Leeds, during the year 1895.*

1895.	Mean Temperature.	Mean Height of Barometer (inches).	Total Amount of Rain in inches.	
			Museum.	Woodhouse Cliff.
January	34·6	29·498	4·00	3·87
February	31·4	29·883	·28	·31
March	42·4	29·431	2·08	1·98
April	47·2	29·623	1·55	1·60
May	54·9	29·861	·43	·43
June	58·4	29·837	3·10	2·97
July	59·3	29·599	6·80	5·97
August	61·6	29·597	1·82	1·82
September	60·0	29·667	1·13	·88
October	45·1	29·558	3·32	3·23
November	45·5	29·568	3·10	2·86
December	39·5	29·507	2·83	3·01

Mean monthly temperature—48°32'.

Mean monthly height of the barometer—29·635 inches.

Total rainfall for the year—Museum 30·44 inches; Woodhouse Cliff 28·93 inches.
Average rainfall at the Museum for the ten years 1886—1895, 24·91 inches.

Greatest degree of heat, indicated by the thermometer in the shade—82° on May 30th; minimum—9° on February 8th.

Greatest barometric pressure—30·45 inches on May 2nd, the temperature of the mercury being 53°; least pressure—28·44 inches on March 28th, the temperature of the mercury being 43°.

Greatest fall of rain (during 24 hours)—1·44 inches on July 2nd.

The Bench Mark at the corner of the Philosophical Hall is 131·8' above the Ordnance datum, and ·8' above the pavement. The cistern of the barometer is 12·8', the thermometers are 42', and the rain-gauge is 45' above the bench mark.

The Hall is situated at 1° 32' 45" or 6 min. 11 sec. W., and 53° 47' 51" N., and hence g/g_{45} is 1·000774. Taking the standard height of the barometer to be 30", and the standard temperature to be 62° F., the height of the homogeneous atmosphere is 27860'. To find the height of a barometer at sea level equivalent to a reading of 11", at a temperature of t° F., different from 62° F., add to the reading $11''$ ($\cdot 0054 \mp \cdot 000011$).

SUNSHINE AT LEEDS IN 1893.

The observations were made by Jordán's Photographic Sunshine Recorder at the following stations:—

1. The Museum of the Philosophical and Literary Society, situate in the centre of the city; elevation above the sea, 145 feet.
2. Woodhouse Cliff, 1½ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the borough.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible duration.
JANUARY	1	33'10	12'7
	2	52'0	20'0
	3	62'50	24'2
FEBRUARY	1	75'40	27'5
	2	86'30	31'1
	3	101'10	39'9
MARCH	1	97'30	26'5
	2	108'10	29'4
	3	118'0	32'1
APRIL	1	153'40	37'0
	2	173'20	41'7
	3	179'40	43'3
MAY	1	235'0	48'8
	2	253'50	52'6
	3	269'20	55'8
JUNE	1	225'30	45'7
	2	239'50	48'5
	3	257'40	52'1
JULY	1	198'40	39'9
	2	219'0	44'0
	3	228'40	46'0
AUGUST	1	182'50	40'7
	2	193'30	43'1
	3	211'0	47'0
SEPTEMBER	1	183'40	48'7
	2	201'50	53'5
	3	219'50	58'3
OCTOBER	1	97'30	29'6
	2	97'30	29'6
	3	118'10	35'9
NOVEMBER	1	28'40	10'8
	2	28'40	10'8
	3	35'10	13'2
DECEMBER	1	18'10	7'4
	2	18'40	7'7
	3	20'0	8'2

SUMMARY FOR THE YEAR

	Hours recorded.		Difference from mean of 7 years in hours.		Per cent. of possible duration.
Museum ..	1,530 0	..	+605'57	..	34'3
Woodhouse Cliff ..	1,672 50	..	+525'09	..	37'3
Lawnswood ..	1,821 30	..	+559'41	..	40'8
37'5 per cent. mean for 1895.			24'4	per cent. mean for 1890.	
29'0	1894.		20'7	..	1889.
31'6	1893.		19'9	..	1888.
27'5	1892.		26'6	..	eight years.
22'2	1891.				

The Meteorological Office publishes the following records of sunshine for 1893, as observed at stations taken as representing specified districts:—

	Hours recorded.		Difference from mean.		Percentage of possible duration.
Scotland, N. (Stornoway, &c.) ..	1,083	..	+ 1	..	28
.. E. (Aberdeen, Marchmont) ..	1,355	..	+146	..	35
.. W. (Glasgow; Douglas, Isle of Man) ..	1,410	..	+ 98	..	32
England, N.E. (Durham, York) ..	1,461	..	+229	..	33
.. N.W. (Stonyhurst, Blackpool, Llandudno) ..	1,343	..	+206	..	34
.. Mid. (Cirencester, Oxford, &c.) ..	1,575	..	+244	..	36
.. S. (London, Hastings, Southampton, &c.) ..	1,776	..	+206	..	39
.. E. (Hillingdon, Goldstone, Cambridge) ..	1,700	..	+225	..	39
.. S.W. (Pembroke, Falmouth, Plymouth, &c.) ..	1,825	..	+231	..	41
Ireland, N. (Armagh, Markree Castle) ..	1,355	..	+151	..	31
.. S. (Dublin, Parsonstown, Valencia) ..	1,598	..	+ 71	..	34
Channel Islands (Jersey) ..	2,034	..	+253	..	48

SUMMARY.

35'8 per cent. mean for United Kingdom, 1895.	30'7 per cent. mean for United Kingdom, 1890.
31'1	1894.
37'0	1893.
35'2	1892.
32'6	1891.
	29'2
	27'5
	32'33
	1889.
	1888.
	8 years.

LIST OF DONATIONS AND ADDITIONS

TO THE
SOCIETY'S MUSEUM AND LIBRARY.

1895-6.

ZOOLOGY.

A series of Guillemot Eggs, from Flambro'	} Mr. H. Bendelack Hewet- son, F.L.S., F.Z.S., Leeds.
Dried Specimen of Flying - fish, (<i>Exocoetus spilopterus</i>), caught by Captain Hewetson, R.N., off St. Helena	
Specimens of British Shells	
Spirit Specimens of Molluscs, Vermes, and Crustaceans	
Green Woodpecker (<i>Gecinns viridis</i>), mounted on stand	} Mrs. Chorley, Headingley.

PALÆONTOLOGY.

Valuable Collection of Bath and In- ferior Oolite Fossils	} Mrs. Morley, Westfield Ter- race, Chapel-Allerton.
Plant remains from the Elland Flag- rock, Gledhow	
Plant remains from the Barnsley Coal Measures	} Mr. H. B. Wilson, Westfield, Armley.
<i>Calamites</i> , &c. from the Grit Rock, Edge Quarry, Thornhill.....	
	} Mr. Walter Wood, Thorn- hill.

MINERALOGY.

Specimen of Kaolinite (in powder) from near Skipton	} Mr. J. J. Wilkinson, Burn- side, Skipton.
Collection of over three hundred speci- mens of Minerals.....	
A series of Mineralogical specimens in Cabinet.....	} Mrs. Morley, Westfield Ter- race, Chapel-Allerton.
	} Mr. Wm. Ward, Leeds.

ARCHÆOLOGY & ETHNOLOGY.

- Two Vases of Alabaster and nineteen
Water Vases, Bowls, and other ves-
sels of baked clay, used by the "New
Race," discovered by Prof. Petrie, on
the edge of the Libyan Desert,
Egypt
- Prof. W. M. Flinders Petrie,
D.C.L., LL.D., London.
- Shell of Triton (*T. variegatus*) used
as a fog-signal by the fishermen of
Catleen Bay, Gibraltar
- Mr. H. Bendelack Hewet-
son, F.L.S.
- One Penny Token, New Brunswick,
1843
- Mr. Oliver Marsden, Leeds.
- Bolas from South America
- Mrs. Burton, Roundhay
Road, Leeds.
- Roman Lamp and Jar of Terra Cotta
and Glass Bottle from the Mines at
Rio Tinto, Spain.....
- Bequeathed by the late Mr.
Robert Henry Wood,
Headingley.
- Two sections of the Wooden Water-
pipes, once laid under certain parts
of Liverpool, for the supply of fresh
water.....
- Collection of Flint, Quartzite, Obsidian
and Siliceous-clay Arrowheads and
Scrapers; Fragments of Pottery and
Spearheads of Iron, collected by Mr.
Edward Jacques from the Indians
of N.W. Canada
- Mr. Edward Atkinson,
F.L.S., Harrogate.
- Bust in plaster of Mr. George Walker,
formerly of Killingbeck Lodge,
Leeds; by Thomas Earle
- Bequeathed by the late Mrs.
Read, Woodhouse Cliff,
Leeds.
- One Pound Leeds Bank Note
- Mr. Samuel Falshaw,
Headingley.

PHOTOGRAPHY.

- Cabinet Photograph of a Flowering
Yucca (*Y. gloriosa*) Napier, N.Z....
- Mr. W. D. Barbour, Provi-
dence Avenue, Leeds.

PUBLICATIONS.

Catalogue of the Library of the Manchester Museum	The Keeper of the Manchester Museum.
Report of the Manchester Museum ...	
Handy Guide to the Manchester Museum	
Catalogue of the Hadfield Collection of Shells, from the Loyalty Ids., in the Manchester Museum	The Rev. J. H. D. Matthews, M.A.
Catalogue of the Library of the Leeds Grammar School.....	
Handbooks on British, Colonial, and Foreign Patents, Trade Marks, and Designs.....	The Author, Mr. C. A. Day, High Holborn, London.
A New Story of the Stars (pamphlet)	Prof. Bickerton, Christchurch, N.Z.
On the Immortality of the Cosmos ...	
Notes on Australian and other Stone Implements (pamphlet)	The Author, Prof. Liverpool.
Boleite, Nantokite, Kerargyrite, and Cuprite from Broken Hill, N.S.W. (pamphlet)	
Œuvres de Camper (planches)	Mr. Edward Atkinson, F.L.S
Spiders of Great Britain, Pts. 1 & 2, by J. Blackwall (Ray Soc.)	Bequeathed by the late Mr. R. B. Morley, M.R.C.S., Chapel-Allerton.
Nudibranchiate Mollusca, Pts. 1—7, by J. Alder and A. Hancock (Ray Soc.)	
Memorials of Ray (Ray Soc.)	
Mineralogy by J. D. Dana, 1844	
Plates of Geological Formations, by Wm. Smith	
Lectures on Natural Philosophy, Vols. 1 & 2, by Dr. Thos. Young	
Giessen Outlines of Analysis by Dr. Hy. Will	
Experimental Researches in Electricity, Vols. 1 & 2 by M. Faraday	
Brander's Hampshire Fossils by Wm. Wood	
Memoirs of Ichthyosauri and Plesiosauri by Thos. Hawkins.....	
Pathological Histology by Gluge	
Memoirs of the Geol. Surv. of the U.K., Decades 5 & 7	
Lichenes Britannici Pts. 4—6, 8, 11, 14—16, by J. Bohler	

Catalogue of the Spiders of Burma ...	The Trustees of the British Museum.
Catalogue of Fishes, Vol. I, 2nd Ed.	
An Introduction to the Study of Rocks	
Catalogue of Birds, Vols. XXV, XXVII	
Catalogue of Fossil Fish, Vol. III ...	
Fossil Plants of the Wealden, Pt. II...	Purchased.
Guide to the British Mycetozoa	
Fauna der Gaskohle, Bd. III, Heft 4	

PERIODICALS.

WEEKLY.

Nature	Purchased.
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BI-WEEKLY.

Bollettino delle Publicationi Italiane	The Compiler.
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MONTHLY.

Annals and Magazine of Natural History	Purchased.
Geological Magazine	
Journal of the Chemical Society	The Society.
Monthly Notices of the Royal Astronomical Society	The Society.
Philosophical Magazine and Journal of Science	
	Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical Society	The Society.

QUARTERLY.

Quarterly Journal of Microscopical Science	Purchased.
Quarterly Journal of Geological Society	
Quarterly Returns of Marriages, Births, and Deaths	Registrar-General.
Journal of the Anthropological Institute	
Zeitschrift für Wissenschaftliche Zoologie	Purchased.

Journal of the Linnean Society { Mr. Edward Atkinson,
F.L.S.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions..... Purchased.
 Proceedings of the Royal Society ... The Society.
 Proceedings of the Royal Institution }
 of Great Britain } The Institution.
 Publications of the Ray Society Purchased.
 Abridgments of Specifications for }
 Patents, Period 1884—88 } The Comptroller General
 of Patents.
 British Association Report..... The Association.
 Greenwich Observations, 1892 }
 Cape Catalogue, Epoch, 1885 } The Astronomer-Royal.
 Memoirs of the Royal Astronomical }
 Society } The Society.
 Radcliffe Astronomical and Meteor- }
 ological Observations } Radcliffe Trustees.
 Symons's British Rainfall, 1894 Purchased.
 Monograph of the Palæontographical }
 Society, Vol. XLIX } Purchased.
 Proceedings of the Yorkshire Geological }
 and Polytechnic Society..... } The Society.
 Transactions of the Leeds Geological }
 Association } The Association.
 Proceedings of the Liverpool Geo- }
 logical Society..... } The Society.
 Journal of the Liverpool Geological }
 Association } The Association.
 Transactions of the Manchester Geo- }
 logical Society } The Society.
 Natural History Transactions of }
 Northumberland, Durham, and } The Tyneside Naturalists'
 Newcastle-upon-Tyne..... } Field Club.
 Proceedings of the Birmingham Philo- }
 sophical Society } The Society.
 Report of the Bradford Philosophical }
 Society } The Society.
 Annual Report of the Yorkshire }
 Philosophical Society } The Society.

Report of the Halifax Literary and Philosophical Society	The Society.
Transactions of the Leicester Literary and Philosophical Society	The Society.
Report of the Committee of Leicester Town Museum	The Museum.
Report of the Royal Institution, Hull	The Institution.
Report of the Meteorological Department of the Borough of Southport, 1894.	The Meteorological Observer.
Annual Report of the Brighton Town Museum	The Museum.
Annual Report, Middlesex Hospital...	The Hospital.
Annual Report of the Birkenhead Literary and Scientific Society	The Society.
Proceedings of the Liverpool Literary and Philosophical Society, Vols. 44-49.	The Society.
Annual Report and Proceedings of the Liverpool Science Students' Association	The Association.
Memoirs and Proceedings of the Manchester Literary and Philosophical Society	The Society.
Annual Report of the Sheffield Literary and Philosophical Society	The Society.
Annual Report of the Chester Society of Natural Science and Literature	The Society.
Transactions of the Leeds Naturalists' Club and Scientific Association.....	The Association.
Journal of the Royal Institution of Cornwall	The Institution.
Annual Report of the Royal Cornwall Polytechnic Society, 1894	The Society.
Report of Associated Architectural Societies	The Society
Journal of the Chester Archaeological and Historic Society	The Society.
Geological Record	Purchased.

Transactions of the Yorkshire Naturalists' Union	} The Union.
Proceedings of the Royal Society of Edinburgh	} The Society.
Transactions do. do. do.	
Transactions of the Edinburgh Geological Society.....	} The Society.
Proceedings of the Glasgow Philosophical Society, 1894-5	} The Society.
Proceedings of the Berwickshire Naturalists' Club	} The Club.
Scientific Proceedings of the Royal Dublin Society.....	} The Society.
Scientific Transactions do. do.	
Transactions of the Royal Irish Academy	} The Academy.
Proceedings do. do. do.	
Journal of the Royal Geological Society of Ireland	} The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club }	The Club.
Publications of the Royal Swedish Academy of Sciences.....	} The Academy.
Papers of the Royal University of Norway	} The University.
Bulletin of the Geological Institution of the University of Upsala, 1894 }	The Institution.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhandling.....	} Royal Danish Society of Sciences.
Bulletin Société Impériale, Moscow ...	} The Society.
"Leopoldina" Amtliches organ der Kaiserlichen, Leopoldino-Carolinischen Deutschen Akademie der Naturforscher	} The Academy.
Mittheilungen der Kais. Königl. Geographischen Gesellschaft in Wien ... }	
Memoirs of the National Academy of Sciences	} The Academy.

Report of Australasian Association for the Adv. of Science, Vol.V.	The Association.
Journal and Proceedings of the Royal Society of New South Wales	The Society.
Journal of the Royal Geographical Society of Australasia	The Society.
Wealth and Progress of New South Wales	The Agent-General.
Records of the Geological Survey of N.S.W.	The Surveyor.
Memoirs of the Geological Survey of N.S.W.	
Annual Report and Papers of the Department of Mines and Agricul- ture, N.S.W.....	The Department.
Prodromus of the Zoology of Victoria	The Editor.
Records of the Australian Museum Report of the Trustees of the Austra- lian Museum.....	The Trustees.
Proceedings of the Royal Society of Queensland	
Transactions and Proceedings of the New Zealand Institute	The Institute.
Papers and Proceedings of the Royal Society of Tasmania	The Society.
Proceedings and Transactions of the Royal Society of Canada, Vol. XII. }	The Society.
Proceedings of the Canadian Institute Annual Report do.	The Institute.
Transactions do.	
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	The Institute.
Annual Report Hamilton Public Library, Ontario, Canada	The Librarian.
Journal and Proceedings of the Hamil- ton Association	The Association.
Geological and Natural History Survey of Canada	Department of the Interior.
Annual Report and Papers—do.	
Contributions to Canadian Palæon- tology	

Memorias de la Sociedad Científica (Mexico)	} The Society.
“ Boletín Mensual ” Observatorio Meteorológico-Magnético, Central de Mexico	
Anuario del Observatorio Astrón- ómico Nacional, Mexico	} The Astronomer.
Boletín del Observatorio Astronómico Nacional de Tacubaya	
Report of the Muséum National, Rio-de-Janeiro	} Directeur Général.
Archivos do.	
Cape Meridian Observations	} Cape Astronomer-Royal.
Report of H.M. Astronomer at the Cape of Good Hope to the Secretary of Admiralty, 1894,	
Transactions of the American Philo- sophical Society	} The Society.
Proceedings do.	
United States Geological Survey, Annual Report	} The Department.
Contributions to American Ethnology.	
United States Geographical and Geo- logical Survey	
United States Department of Agricul- ture, Publications of	} The Department.
Jack Rabbits of the United States ...	
Common Crow do. do. ...	
Pocket Gophers do. do. ...	
Report of the Smithsonian Institution Smithsonian Miscellaneous Collections Smithsonian Contributions	} The Institution.
Annual Reports of the Bureau of Ethnology	
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Dodgson, Mrs.	. Southleigh, Headingley.
Ellison, Miss	. 10, De Grey Road.
Glover, Miss	. 16, De Grey Road.
Glover, Miss Mary	. Do.
Green, Miss	. 1, Tanfield Place.
Green, Miss Ethel	. Do.
Haigh, Miss	. 14, Monkbridge Road, Headingley.
Haigh, Miss E.	. Do. do.
Hallilay, Mrs.	. 28 Burley Road.
Hannam, Mrs. W. S.	. 4, East Parade.
Hassé, Mrs.	. 31, Commercial Street.
Hassé, Eric	. Do.
Hebblethwaite, Mrs.	. 5, Grosvenor Road, Headingley
Hellier, Mrs.	. 1, De Grey Terrace.
Hepper, Mrs. J. A.	. Clareville, Headingley.
Hewetson, Mrs. H. B.	. 9, Hanover Square.

Hirsch, Mrs. Paul	. 29, Cookridge Street.
Hirsch, Miss Annie	. Do.
Illingworth, G. N.	. Flower Bank, Burley.
Jackson, Miss	. Allerton Hall, Leeds.
Jessop, Miss	. Roundhay Mount.
Jessop, Miss Maude	. Do.
Josephy, Mrs. B.	. 25, Hyde Terrace.
Josephy, Miss	. Do.
Josephy, Miss B.	. Do.
Josephy, Mrs. H.	. 5, Beech Grove Terrace.
Josephy, Miss	. Do.
Josephy, H.	. Do.
Kitson, Mrs. F. J.	. Oatlands, Burley, Leeds.
Lupton, Mrs. A.	. 6, De Grey Road.
Mathers, Miss	. Hanover House.
Matthews, E. D.	. Grammar School, Leeds.
Morley, Mrs.	. 14, Westfield Terrace, Chapeltown.
Myers, Miss	. Mrs. Stuhlmann, Cavendish Rd.
Nelson, Miss C. E.	. St. John's Cottage, St. John's Rd.
Nelson, Miss Louisa	. Do. do.
Nicholson, Mrs. J. C.	. Moorfield House, Headingley.
Nicholson, Miss	. Do. do.
Nicholson, W. E.	. Do. do.
Nussey, Miss	. Potternewton Hall.
Nussey, Miss E.	. Springville, Shaw Lane.
Nussey, Miss M.	. Do. do.
Pepper, Mrs. J. E.	. 42, Hyde Terrace.
Phillips, Miss	. Mrs. Stuhlmann, Cavendish Rd.
Redmayne, Mrs. John	. Grove House, Headingley.
Richardson, Mrs.	. Cliff Road.
Rickards, Miss	. Wortley.
Rumboll, Mrs.	. Hope Villa, Woodhouse Lane.
Ryder, Miss E. I.	. Gledhow Hill.
Ryder, Miss Louisa	. Do.
Saville, Miss S. E.	. 35, Ash Grove, Headingley.

Scattergood, Miss	. 41, Park Square.
Slade, Mrs. R.	. 14, Springfield Mount.
Slade, Miss E. M.	. Do.
Slade, R. H.	. Do.
Somers, Mrs.	. 48, Woodhouse Lane.
Stables, Mrs. M.	. Hope Villa, Armley.
Stables, Miss	. Horsforth.
Stables, Miss Lucy	. Do.
Stockdale, Miss E.	. Spring Lea, Springfield Mount.
Stockdale, Miss M. B.	. Do. do.
Stroud, Mrs. W.	. Rupert Lodge, Grove Road.
Talbot, Mrs. G.	. Southfield, Burley.
Talbot, Miss	. Do.
Talbot, Miss L.	. Do.
Teale, Miss	. North Grange, Headingley.
Tetley, Mrs. C. F.	. Cardigan Road, Headingley.
Thornley, Miss	. Mr. Illingworth, Flower Bank.
Wager, Mrs.	. Bank Villa, Chapel-Allerton.
Walker, Mrs. A. T.	. Bainbrigge Terrace, Headingley.
Walker, Miss E. H.	. Newton Park.
Walker, Miss M. H.	. Do.
Walker, Miss M. I.	. Do.
Ward, Mrs. G.	. Buckingham Terrace.
Watson, Mrs. Charles	. Burton Grange, Far Headingley.
Willson, Miss Emilie Dorothy	. Ballamona, Headingley.
Willson, Miss Margaret	. Do.
Wood, Miss Edith	. 27, Cardigan Road.

Members and Subscribers are requested to inform the Secretary of any errors that may be found in the above list.

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D.C.L., Athenæum Club,
London.

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M.D., F.R.S., Cambridge.

The Right Rev. Bishop Barry,
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Windsor.

Prof. Graham Bell, The National
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St., Boston, Mass., U.S.A.

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Duca Frederico Lancia di Brolo.

Joseph Burland, South Cave.

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21, Eccleston Square, Pimlico,
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H. G. Moore, Glenmark, New Zealand.

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C. C. Oxley, Minster House,
Ripon.

Sir T. Wemyss Reid, 26,
Bramham Gardens, South
Kensington, London.

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don.

Edward Harry Woods, Rosario,
Argentine Republic.

THE
SEVENTY-SEVENTH REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1896-7.

READ AT THE ANNUAL MEETING, MAY 4th, 1897.

LEEDS:
JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS, 78, ALBION STREET.

1897.

THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY consists of the following Classes of Members and Subscribers:—

- (1.) ORIGINAL PROPRIETARY MEMBERS (holding £100 Shares), who are entitled to personal admission to the Museum, Library, Lectures, and all other Meetings of the Society, and to two transferable tickets to admit visitors to the Lectures. They are exempt from Annual Subscription.
- (2.) NEW PROPRIETARY MEMBERS (holding £50 Shares), who are entitled to similar personal privileges, and to two transferable tickets. Subscription, £1 is. per annum.
- (3.) ORIGINAL ORDINARY MEMBERS (holding £3 3s. Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £2 2s. per annum.
- (4.) NEW ORDINARY MEMBERS (holding £20 Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £1 is. per annum.

The following are entitled to personal admission to the Museum, Library, and Lectures, but not to business meetings; nor have they any transferable tickets to admit visitors:—

- (5.) HONORARY MEMBERS, elected on the recommendation of the Council.
- (6.) SUBSCRIBERS of £1 is. per annum.
- (7.) SUBSCRIBERS of 7s. 6d. per annum, being Ladies or Young Persons resident with Members, or with Subscribers in Class (6).

A list of shares from time to time offered for sale by Members is kept in the office, and information as to price, &c., may be obtained from the Secretary.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members, voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE CLOSE OF THE

SEVENTY-SEVENTH SESSION.

Twelve General Meetings have been held during the past Session. The Session was opened by the Earl of Crewe, who delivered an address on "Parliamentary Eloquence in England." Warm acknowledgments are due to his Lordship for this fresh mark of his interest in the work of the Society. The Society has also to thank the President (Mr. Edmund Wilson), Mr. P. F. Kendall, Principal Bodington, and Mr. J. R. Mozley for interesting lectures delivered gratuitously.

The list of Lectures is as follows:—

- 1.—"Parliamentary Eloquence in England." By the RIGHT HON. THE EARL OF CREWE. *Oct. 20th, 1896.*
- 2.—"The Rise of the Dutch Republic." By FREDERIC HARRISON, M.A. *Nov. 3rd, 1896.*
- 3.—"Les Mémoires du Baron de Marbot." By B. MINSEN, M.A. *Nov. 17th, 1896.*
- 4.—"Death and the Under-world, as illustrated in Greek Art." By LADY EVANS. *Dec. 1st, 1896.*
- 5.—"The Ice Age in Yorkshire." By PERCY F. KENDALL, F.G.S. *Dec. 15th, 1896.*
- 6.—"Melody." By W. H. HADOW, M.A., Mus. Bac. *Jan. 5th, 1897.*
- 7.—"Japan." By Rev. CANON TRISTRAM, D.D., LL.D., F.R.S. *Jan. 19th, 1897.*

- 8.—“The Story of Lanuvium, with reference to the Savile Collection of Antiquities.” By Principal BODINGTON, Litt.D. *Feb. 2nd, 1897.*
- 9.—“Personal Impressions of Robert Louis Stevenson.” By EDMUND GOSSE, M.A. *Feb. 16th, 1897.*
- 10.—“Jersey.” By EDMUND WILSON (President). *March 16th, 1897.*
- 11.—“The Nature and Properties of X Rays.” By Prof. OLIVER J. LODGE, D.Sc., F.R.S. *March 23rd, 1897.*
- 12.—“The Loss of Calais as one of the turning points of History.” By JOHN RICKARDS MOZLEY, M.A. *April 6th, 1897.*

The number of Members and Subscribers is as follows:—

	1896.	1897.
Original Proprietary Members (78 Shares)...	60	57
New Proprietary Members (121 Shares) ...	82	81
Ordinary Members	2	2
New Ordinary Members	66	65
Annual Subscribers of £1 1s.	120	112
Annual Subscribers of 7s. 6d.	111	101
	<hr/> 441	<hr/> 418

24,614 persons have paid for entrance to the Museum.

The past Session of the Society has been marked by an event which the Council record with the utmost gratification. By the munificence of the late Lord Savile, the collections of the Society have been enriched by an addition which, both in interest and value, surpasses any donation made to the Society in recent times. This gift, which will be known as The Savile Collection, consists of a large number of objects accumulated by Lord Savile during excavations at Civita Lavinia, the ancient Lanuvium. The history and significance of these relics were explained in an interesting lecture delivered to the Society by Principal Bodington, who had visited the site of their discovery.

The Council desire to acknowledge the great skill and judgment with which the objects have been mounted and arranged by the Curator, Mr. H. Crowther, who acted under the

direction of a special Committee, consisting of the President, the Rev. C. Hargrove, Dr. Bodington, Mr. Thos. Marshall, and Dr. Eddison. The importance and extent of the collection decided the Council to make a special arrangement for its display, and for this purpose the room hitherto used as an Industrial Museum was selected. This room was cleared of its contents, and now contains the whole of the Savile Collection, together with such other valuable objects possessed by the Society as are appropriate to a Museum of Greek and Roman Archæology.

The most striking objects presented by Lord Savile are the heads and shoulders of four horses, three being originals in marble, and the fourth a plaster cast of an original now in the British Museum. The horses are free in their execution and spirited in expression and movement. Along with these are the marble torsos of warriors or outriders clothed with chlamys, lorica and tunic, girt round the waist with fringed girdles, and carrying short swords. There are also many fragments of various portions of the limbs of the horses, saddle cloths, and sandaled feet of the warriors. Lord Savile suggested that an equestrian group, of which these are parts, occupied a quadrangle exposed in excavating, of which, as also of other associated discoveries, photographs are hung near the Savile Collection.

A small table of veined marble, probably of Republican times, bears the following dedication :—Q. LABE. Q. F. JOVI BEONO (Quintus Laberius, the son of Quintus to Jupiter the good). Other marble objects are busts of Bacchus, Silenus, various heads, torsos, altars, pilasters, and a roof-tile with an eagle in relief.

The numerous objects in terra-cotta, of an archaic Greek character, include a painted female head, in an excellent state of preservation, which was the finial ornament of a water-pipe from the top of a temple; slabs of polychrome terra-cotta, with an ornate frieze from the exterior of a temple, votive offerings and a large series of lamps.

The pottery, which occupies a central case in the room, consists of fragments, more or less perfect, of Athenian vases, dishes, jars, unguents, Arretine and Italo-Greek painted ware of about 500—400 B.C. In other cases are displayed bronze keys, surgical instruments, nails, lamp, fibulæ, &c.; hairpins, styli, needles and spoons in ivory, and various objects in lead, iron and glass.

The collection of silver and copper coins, over two hundred in number, is chiefly Republican and Roman Imperial, extending from 350 B.C. to the end of the 4th Century A.D.

The desire of the Society to make Lord Savile one of its Honorary Members was unhappily frustrated by the death of his Lordship, which occurred on November 28th, 1896, almost immediately after the reception of his generous gift. He bequeathed to the Society a bust of himself executed in marble by Van der Kerkhove Saibas, at Brussels. This bust, which was gratefully received by the Council from the present Lord Savile, finds a fitting place in the Savile Room.

It has been thought advisable to display in the same room as the Savile Collection the fine series of Ancient Marbles, which was presented in 1863-4 to the Museum by the Rev. John Gott, D.D., now the Lord Bishop of Truro, and which was collected by Mr. Benj. Gott and Mr. Rawson during a tour in Greece, in 1815. The Greek stelæ and the marble doors, of the Hellenistic Period, have been placed in glass cases, and the altars and larger marbles on stands on the floor.

On the north wall of the same room the large mosaic from a Roman bath at Aldborough—the Isurium of the Romans—has been fixed in a good light, and near, on a stand, the Roman altars from Castleford and Chapeltown, Leeds.

Other gifts to the Museum have been unusually numerous and valuable. Mr. F. Atkinson, of Murraysburg, a son of one of the Hon. Curators of the Museum, has presented a clavicle

of one of the extinct Anomodont Reptiles, of the Trias, of South Africa; nests of the Penduline Tit and other natural history objects. Mr. H. Bendelack Hewetson, F.L.S., a wing of the Standard-winged Goatsucker, with the seasonal elongation of the ninth primary, from Mashonaland, fossil oysters and sea-urchins from the Oolite of El Kantara, Algeria, and recent shells from the Sahara.

A very acceptable collection of microscopical and other entomological objects has been presented by Mr. Fred Enock, F.E.S., of London, which includes the Hessian fly in various stages, several related forms and parasites; Stylops and the two sexes of the British Trap-door Spider and nests.

A series of over forty specimens of South African Butterflies, many recently new to science, from Mr. Guy A. K. Marshall, London. Eggs of a Crocodile killed at Assouan and other objects, from Mr. Aquila Dodgson, Headingley. A mummied foot of a lady from Thebes, of about 1700 B.C., by the Rev. J. Ridley, Brownhill Vicarage, Birstall. Nest of garden warbler, hedgehog, and other specimens of natural history, from Mrs. J. E. Eddison, Adel. Specimen of flexible sandstone from Prof. Miall, F.R.S. Silver coins of Æthelbert, William the Lion of Scotland, and the Emp. Hy. VII. of Luxemburg, from the Rev. T. Thistlethwaite Smith, M.A., Leeds.

Mr. Edward Allen, of York, has kindly presented two mounted specimens of the Sooty Shearwater (*Puffinus griseus*), rare British birds, which were shot at Bridlington, in December, 1895. Mr. J. W. Dixon, of Leeds, a series of microscopical slides of foraminifera.

Mr. Robert Arthington, formerly of Leeds, has given a 17th century spherical sundial, which at one time stood on a building at Farnley, belonging to one of his ancestors, Robert Arthington, who lived at Farnley Hall, and was steward for the Danby family.

Mr. Monkman, Leeds, has presented a pair of old folding doors, with lock, from a building which the donor is demolishing, for improvements, in Mill Hill, and which at one time gave entrance to a chapel, and afterwards to a post-office.

The use of the Museum by students in special subjects has been sustained; sixty-seven references have been made to the various cabinet collections. Specimens have been lent to the Biological, Chemical, Dyeing and other departments of the Yorkshire College; undergraduates of the Victoria University have taken advantage of the general collections, facilities having been given to handle specimens, and ten visits have been made by classes of Board School children under the charge of teachers.

The Council have pleasure in again acknowledging many valuable donations to the Library from the Trustees of the British Museum, the Smithsonian Institute and other learned Societies. Mr. Stephen A. Marshall, B.A., of Ambleside, has presented a copy of the rainfall, at the Philosophical Hall, from July, 1823, to June, 1834, which is printed in full elsewhere in the Report of the Society.

The weekly records of meteorological observations furnished to the newspapers have been made still more valuable by the addition of the mean weekly temperature of the ground at a depth of two feet six inches, as registered by a Symons' Earth Thermometer by Mr. Richard Reynolds, F.C.S., in his garden at Cliff Road, Headingley. The daily readings being duly entered in the Meteorological Charts.

The Council have to record, with regret, the death of Mr. George Lane Fox, an Honorary Member of the Society, and a liberal donor of archæological objects to the Society's collections.

The Leeds Committee, appointed under the auspices of the Society for the promotion of a memorial to the late Prof. Huxley, succeeded in its objects, and was able to forward a substantial contribution to the Central Committee.

*Summary of Meteorological Observations taken at the Philosophical Hall,
Leeds, during the year 1896.*

1896.	Mean Temperature.	Mean Height of Barometer (inches).	Total Amount of Rain in inches.	
			Museum.	Woodhouse Cliff.
January	41.9	30.039	.46	.53
February	41.2	30.039	.82	.82
March	43.7	29.491	2.82	3.04
April	48.2	29.940	1.21	1.25
May	54.2	30.032	.50	.47
June	61.3	29.691	3.56	4.51
July	62.7	29.782	1.42	1.61
August	57.4	29.789	1.92	2.07
September	54.7	29.486	3.19	3.49
October	44.6	29.471	3.97	3.83
November	41.6	29.922	1.52	1.76
December	39.9	29.458	3.39	3.25

Mean monthly temperature—49.28°.

Mean monthly height of the barometer—29.761 inches.

Total rainfall for the year—Museum 24.78 inches; Woodhouse Cliff 26.63 inches.
Average rainfall at the Museum for the ten years 1887—1896, 24.31 inches.

Greatest degree of heat, indicated by the thermometer in the shade—85° on June 13th; minimum—26° on February 26th and November 6th.

Greatest barometric pressure—30.88 inches on January 9th, the temperature of the mercury being 48°; least pressure—28.40 inches on March 3rd, the temperature of the mercury being 47°.

Greatest fall of rain (during 24 hours)—.96 inches on June 4th.

The Bench Mark at the corner of the Philosophical Hall is 131.8' above the Ordnance datum, and .8' above the pavement. The cistern of the barometer is 12.8', the thermometers are 42', and the rain-gauge is 45' above the bench mark.

The Hall is situated at 1° 32' 45" or 6 min. 11 sec. W., and 53° 47' 51" N., and hence g/g_{45} is 1.000774. Taking the standard height of the barometer to be 30", and the standard temperature to be 62° F., the height of the homogeneous atmosphere is 27860'. To find the height of a barometer at sea level equivalent to a reading of 11", at temperature of t° F., different from 62° F., add to the reading 11" ($.0054 \mp .000011$).

SUNSHINE AT LEEDS IN 1896.

The observations were made by Jordan's Photographic Sunshine Recorder at the following stations:—
 1. The Museum of the Philosophical and Literary Society, situate in the centre of the city; elevation above the sea, 145 feet.
 2. Woodhouse Cliff, $1\frac{1}{2}$ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb.
 3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the borough.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible duration.
JANUARY	1	21'35	8'33
	2	34'30	13'31
	3	37'40	14'54
FEBRUARY	1	20'0	7'19
	2	27'10	9'77
	3	22'10	7'97
MARCH	1	106'25	29'0
	2	120'0	32'71
	3	104'55	28'60
APRIL	1	123'0	29'65
	2	148'40	35'83
	3	180'10	43'43
MAY	1	183'05	37'98
	2	210'05	43'61
	3	213'0	44'18
JUNE	1	175'30	35'48
	2	198'15	48'08
	3	206'0	41'65
JULY	1	161'05	32'42
	2	174'30	35'12
	3	183'55	37'02
AUGUST	1	81'0	18'04
	3	100'20	22'35
	3	112'30	25'06
SEPTEMBER	1	57'20	13'62
	2	68'20	17'69
	3	81'05	21'51
OCTOBER	1	51'0	15'51
	2	73'0	22'21
	3	80'30	24'49
NOVEMBER	1	23'30	8'83
	2	46'20	17'52
	3	65'10	24'65
DECEMBER	1	3'30	1'44
	2	17'10	7'07
	3	37'0	15'24

SUMMARY FOR THE YEAR

	Hours recorded.		Difference from mean of 9 years in hours.		Per cent. of possible duration.
Museum ..	1,007 0 ..		+ 53'15 ..		22'60
Woodhouse Cliff ..	1,218 20 ..		+ 43'12 ..		27'31
Lawnswood ..	1,324 05 ..		+ 49'31 ..		29'72
26'5 per cent. mean for 1896.			22'2	per cent. mean for 1891.	
37'5 ..	1895.		24'4	..	1890.
29'0 ..	1894.		20'7	..	1889.
31'6 ..	1893.		25'9	..	nine years.
27'5 ..	1892.				

The Meteorological Office publishes the following records of sunshine for 1896, as observed at stations taken as representing specified districts:—

	Hours recorded.	Difference from mean.	Percentage of possible duration.
Scotland, N. (Stornoway, &c.) ..	938 ..	- 64 ..	22
.. E. (Aberdeen, Marchmont) ..	1,240 ..	- 35 ..	28
.. W. (Glasgow; Douglas, Isle of Man) ..	1,338 ..	- 4 ..	30
England, N.E. (Durham, York) ..	1,239 ..	- 37 ..	28
.. N.W. (Stonyhurst, Blackpool, Llandudno)	1,247 ..	+ 5 ..	30
.. Mid. (Cirencester, Oxford, &c.) ..	1,335 ..	- 22 ..	31
.. S. (London, Hastings, Southampton, &c.)	1,593 ..	- 7 ..	36
.. E. (Hillingdon, Geldestone, Cambridge)	1,488 ..	- 47 ..	34
.. S.W. (Pembroke, Falmouth, Plymouth, &c.)	1,743 ..	+ 94 ..	39
Ireland, N. (Armagh, Markree Castle) ..	1,238 ..	- 29 ..	28
.. S. (Dublin, Parsonstown, Valencia) ..	1,439 ..	- 4 ..	33
Channel Islands (Jersey) ..	1,915 ..	+ 15 ..	43

SUMMARY.

31.8 per cent. mean for United Kingdom, 1896.	32'5 per cent. mean for United Kingdom, 1891.
35'3 ..	1895.
31'1 ..	1894.
37'0 ..	1893.
35'2 ..	1892.
	35'6 ..
	or 32'65 per cent. mean for ten years.

RAINFALL AT THE PHILOSOPHICAL HALL, LEEDS,

From July, 1823, to June, 1834.

Copied by Mr. Stephen A. Marshall, B.A., from notes, in the writing of Mr. Henry Cowper Marshall, in a book containing detailed Meteorological Observations at Headingley House, Leeds, together with the monthly totals of rain at various other places in the years 1818 to 1839.

YEAR.	1823.	1824.	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
January ...	—	1'00	1'20	'46	1'48	2'58	'28	'10	2'32	'84	'66	3'81
February ...	—	'61	'24	2'61	'63	'64	'12	'23	2'49	'18	2'80	1'42
March ...	—	2'26	1'10	'55	2'38	1'52	'10	'11	2'04	1'40	1'17	1'37
April ...	—	'79	1'39	1'59	'97	1'19	'18	1'26	1'42	3'05	2'21	1'00
May ...	—	'56	2'61	'53	1'66	1'69	'10	3'71	1'96	1'24	1'34	1'50
June ...	—	2'08	1'20	'39	*1'74	2'96	2'10	3'59	2'30	3'93	3'52	1'80
July ...	3'88	'71	'54	1'59	1'31	5'76	5'17	3'59	3'48	2'14	1'24	—
August ...	4'24	1'68	2'51	1'64	2'83	2'87	6'66	1'95	3'70	4'33	3'36	—
September ...	2'19	3'72	1'70	3'75	1'66	2'20	2'20	4'52	1'26	'54	1'83	—
October ...	2'44	6'21	2'39	1'77	4'31	1'10	1'29	'30	4'50	2'50	1'59	—
November ...	1'66	2'99	2'90	1'14	1'46	1'32	1'43	2'71	3'96	2'58	1'74	—
December ...	3'96	4'11	2'86	1'25	3'00	2'07	'03	1'64	2'10	2'60	3'46	—
YEARLY TOTAL ...	—	26'72	20'64	17'27	23'43	25'90	19'66	23'71	31'53	25'33	24'92	—

* 1827 is entered twice over, in parallel Columns, differing in the amount for June, which is stated as 1'74 and as 0'84, with a X calling attention to the difference. From comparison with the fall at Headingley House that month, I conclude 1'74 is correct.—S.A.M.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Payments for the year 1896-7.

RECEIPTS.		£	s.	d.	PAYMENTS.		£	s.	d.	£	s.	d.
To Balance in Bank, May 1st, 1896	...	...	...	55	18	8	By Repairs and Alterations	...	...	77	12	8
" Annual Subscriptions, viz.:-							" Rates and Taxes	...	...	24	2	6
74 New Proprietary Members, at 21s.	...	77	14	0	" Fire Insurance	...	" Coals, &c.	...	...	12	10	0
2 Original Ordinary	"	4	4	0	" Gas	...	" Cleaning	...	...	20	10	6
60 New Ordinary	"	63	0	0	" Salaries and Wages	...	" Fees to Auditor	...	...	21	12	8
114 Annual Subscribers, at 21s.	...	119	14	0	" Collections, Library, and Scientific Apparatus	...				7	9	7
101 Annual Subscribers, at 7s. 6d.	...	37	17	6	" Saville Collection	...				304	9	0
" Arrears	...	8	3	6	" Postages	...				2	2	0
" Rent, viz.:-				310	13	0	" Advertising and Printing	...	...	31	13	2
Cellars	...	40	0	0	" Lectures	...				75	13	8
Lecture Room	...	204	15	6	" Sundries	...				9	3	3
" Receipts from Visitors to Museum	...	...	...	244	15	6	" Electric Light Supply	...	...	23	15	3
" Sale of Guides	...	1	11	3	" Balance in hand	...				89	15	6
" Bank Interest	...	0	17	0						17	9	9
" Sundries	...	5	19	6						140	3	9
" Balance due to Bank	...	...	...	8	7	9				4	1	2
				0	12	2				0	17	7
				<u>£722 18 3</u>						<u>£722 18 3</u>		

We have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.
LEEDS, June 1st, 1897.

BEEVERS & ADGIE,
CHARTERED ACCOUNTANTS.

LIST OF DONATIONS AND ADDITIONS

TO THE
SOCIETY'S MUSEUM AND LIBRARY.

1896-7.

ZOOLOGY.

Specimens in spirit of Scorpion (<i>Opis-</i> <i>thoplthalmus glabrifrons</i>); Grass- hopper (<i>Ephippigera</i>), Mantis, Spiders (2) and Lizards (<i>Agama</i>). Nests (2) of Penduline Tit (<i>Ægi-</i> <i>thalus capensis</i>)	Mr. F. Atkinson, Murrays- burg, Cape Colony.
Eggs of Tortoise from S.W. Africa ...	
Specimens of Locusts	
Wing of Standard-winged Goatsucker (<i>Cosmetornis vexillarius</i>), from Mashonaland	Mr. H. Bendelack Hewet- son, F.L.S., Leeds.
Specimens of Shells of <i>Helix deser-</i> <i>torum</i> , <i>H. candidissima</i> , <i>Bulinus</i> <i>decollatus</i> , &c., from Biskra, Sahara..	
Collection of over Forty named speci- mens of South African Butterflies...	Mr. Guy A. K. Marshall, Connaught Sq., London.
Specimens of Mussel Scale and Mealy Bug	Mr. Thos. Garnett, St. John's, Wakefield.
Nest of a Garden Warbler (<i>Sylvia</i> <i>hortensis</i>) and egg, and specimens of Hedgehog and Robin	Mrs. John E. Eddison, Adel.
Eggs of Crocodile, in spirit, from an animal 12 ft. long, killed at Assouan, Dec. 28th, 1891	Mr. Aquilà Dodgson, South- leigh, Headingley.
Common Snake (<i>Tropidonotus natrix</i>), in spirit.....	

- Nests of British Trap-door Spider
(*Atypus piceus*), and specimens in
spirits of male and female animals..
- Microscopical specimens of *Stylops*
Spencei; Hessian fly (*Cecidomya*
destructor, m. and f.); Parasites of
Hessian fly (*Merisus destructor*),
America; *M. intermedius*, Russia;
M. subaptera; *Entedon epigonus*,
England and Russia
- Straw infested with Hessian fly
- Stylopized Bee (*Andrena atriceps*) ...
- Two specimens of Sooty Shearwater
(*Puffinus griseus*), shot at Bridling-
ton, Dec., 1895.....
- Specimen of an Adder (*Vipera berus*),
from Skipwith Common, near Selby
- A series of Microscopical Slides of
Foraminifera
- Mr. Fred Enock, F.L.S.,
Holloway, London, N.
- Mr. Edward Allen, Fease-
gate, York.
- Mr. Councillor C.H. Wilson,
Leeds.
- Mr. J. W. Dixon, Leeds.

PALÆONTOLOGY.

- Clavicle of an Anomodont Reptile
from the Karroo Rocks, Triassic
Formation, Murraysburg, S. Africa.
- Specimens of *Calamites* and *Dadoxylon*,
from Grit Rock, Edge Quarry,
Thornhill
- Specimen of *Scaphites* from the Chalk,
Bessingley Hill, Bridlington
- Specimens of *Ostrea* and Echinoderms,
from the Oolite, El Kantara,
Algeria
- Mr. F. Atkinson, Murrays-
burg, S. Africa.
- Mr. Walter Wood, Thorn-
hill.
- Mr. J. Courtney, Oxford
Street, Bridlington.
- Mr. H. Bendelack Hewet-
son, F.Z.S., Leeds.

MINERALOGY.

- Specimen of Flexible Sandstone
- Specimen of Gold-ore from Cool-
gardie, Australia
- * Prof. Miall, F.R.S., York-
shire College.
- Mr. John C. Nicholson, Moor-
field House, Headingley.

ARCHÆOLOGY & ETHNOLOGY.

- Bust of the late Rt. Hon. Lord Savile, P.C., G.C.B., in marble, by Van der Kerkhove Saibas..... } The late Rt. Hon. Lord Savile, Rufford Abbey.
- Large collection of objects excavated by the donor at Civita Lavinia (ancient Lanuvium), which includes heads of horses, torsos of outriders, roof-tile, busts, masks, sandaled feet, altars and pilasters in marble. Antifixal roof-tile, representing the mask of a woman in relief, and slabs of a painted cornice from an Archaic Greek Temple, unguents, vases, jars, saucers, a large series of lamps, and fragments of Arretine, painted Italo-Greek ware and other objects in terra-cotta. Carved knife-handles, pieces of flutes, styli, hairpins, needles and spoons in ivory. Large cylindrical vessel and bucket, oil flask, lamp, surgical instruments, keys, fibulae, needles, &c., in bronze. Inscribed ladle, palette and knobs in lead. Unguents and other objects in glass, and a series of silver and copper coins dating from 350 B.C. to 4th Century A.D. } The late Rt. Hon. Lord Savile, P.C., G.C.B., Rufford Abbey, Ollerton, Notts.
- Mummied foot of a lady from Thebes, belonging to a later period than the 18th dynasty, about 1700 B.C., but not later than 21st dynasty } The Rev. J. Ridley, M.A., Brownhill Vicarage, Birstall.
- Seventeenth Century spherical Sundial from Farnley, Leeds } Mr. Robert Arthington, Leeds.
- Three Silver Coins — Æthelbert, William the Lion of Scotland, and Henry VII., Count of Luxemburg.. } The Rev. T. Thistlethwaite Smith, M.A., Virginia Road, Leeds.
- Pair of Old Doors and lock, from a building now being demolished in Mill Hill, Leeds, formerly a chapel, later a post-office } Mr. George Monkman, Builder, Gt. George St., Leeds.
- Specimen-box Shoot } Mr. Fred Reynolds, Brigade, Leeds.

PUBLICATIONS.

Catalogue of Fossil Bryozoa.....	The Trustees of the British Museum.
Catalogue of Jurassic Bryozoa	
Catalogue of Madreporia, Vol. II. ...	
Catalogue of Snakes, Vol. III.	
Catalogue of Birds, Vol. XXIV.	
Copy of the Rainfall which fell at the Philosophical Hall, Leeds, from July, 1823, to June, 1834	Mr. Stephen A. Marshall, B.A., Ambleside.
Report of the Proceedings of the Conference on Inland Navigation, Birmingham, 1895	The Federated Institution of Mining Engineers, Newcastle-on-Tyne.
On portions of a Cranium and a Jaw in a slab containing fossil remains of the Archæopteryx, by Sir John Evans (pamphlet)	Lady Evans.
General Index to the Monthly Notices of the Royal Astronomical Society, 1869-92, Vols. XXX.—LII.	The Royal Astronomical Society.
S.S. Tantallon Castle	Castle Mail Packets Co., Edinburgh.
Report of Leeds Records	The Town Clerk, Leeds.
Process Year Book, 1896	Mr. Joseph Scholefield, London.
General Index to the First fifty Vols. of the Quarterly Journal of the Geological Society	The Geological Society of London.

PERIODICALS.

WEEKLY.

Nature	Purchased.
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BI-WEEKLY.

Bollettino delle Publicationi Italiane	The Compiler.
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MONTHLY.

Annals and Magazine of Natural History.....	Purchased.
Geological Magazine	

Journal of the Chemical Society	The Society.
Monthly Notices of the Royal Astro- nomical Society	} The Society.
Philosophical Magazine and Journal of Science	
	Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical Society	} The Society.

QUARTERLY.

Quarterly Journal of Microscopical Science	} Purchased.
Quarterly Journal of Geological Society	The Society.
Quarterly Returns of Marriages, Births, and Deaths.....	} Registrar-General.
Journal of the Anthropological Institute	} The Institute.
Zeitschrift für Wissenschaftliche Zoo- logie	} Purchased.
Journal of the Linnean Society	{ Mr. Edward Atkinson, F.L.S.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions.....	Purchased.
Proceedings of the Royal Society ...	The Society.
Proceedings of the Royal Institution of Great Britain	} The Institution.
Publications of the Ray Society	Purchased.
Abridgments of Specifications for Patents, Period 1884—88	} The Comptroller Genera of Patents.
British Association Report.....	The Association.
Greenwich Observations, 1893	The Astronomer-Royal.
Memoirs of the Royal Astronomical Society	} The Society.
Radcliffe Astronomical and Meteor- ological Observations	} Radcliffe Trustees.
Symons's British Rainfall, 1895	Purchased.
Monograph of the Palæontographical Society	} Purchased.

Proceedings of the Yorkshire Geological and Polytechnic Society.....	} The Society.
Transactions of the Leeds Geological Association	} The Association.
Proceedings of the Liverpool Geological Society.....	} The Society.
Journal of the Liverpool Geological Association	} The Association.
Transactions of the Manchester Geological Society	} The Society.
Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne.....	} The Tyneside Naturalists' Field Club.
Proceedings of the Birmingham Philosophical Society	} The Society.
Annual Report of the Yorkshire Philosophical Society	} The Society.
Transactions of the Leicester Literary and Philosophical Society	} The Society.
Report of the Committee of Leicester Town Museum	} The Museum.
Report of the Royal Institution, Hull	The Institution.
Report of the Meteorological Department of the Borough of Southport.	} The Meteorological Observer.
Annual Report of the Brighton Town Museum	} The Museum.
Annual Report, Middlesex Hospital...	The Hospital.
Annual Report of the Birkenhead Literary and Scientific Society	} The Society.
Proceedings of the Liverpool Literary and Philosophical Society	} The Society.
Annual Report and Proceedings of the Liverpool Science Students' Association	} The Association.
Memoirs and Proceedings of the Manchester Literary and Philosophical Society	} The Society.
Annual Report of the Sheffield Literary and Philosophical Society	} The Society.

Annual Report of the Chester Society of Natural Science and Literature	} The Society.
Transactions of the Leeds Naturalists' Club and Scientific Association.....	} The Association.
Journal of the Royal Institution of Cornwall	} The Institution.
Annual Report of the Royal Cornwall Polytechnic Society.....	} The Society.
Report of Associated Architectural Societies	} The Association.
Journal of the Chester Archæological and Historic Society	} The Society.
Geological Record	Purchased.
Transactions of the Yorkshire Natural- ists' Union	} The Union.
Proceedings of the Royal Society of Edinburgh	} The Society.
Transactions do. do.	
Transactions of the Edinburgh Geo- logical Society.....	} The Society.
Proceedings of the Glasgow Philoso- phical Society	} The Society.
Proceedings of the Berwickshire Naturalists' Club	} The Club.
Scientific Proceedings of the Royal Dublin Society.....	} The Society.
Scientific Transactions do.	
Transactions of the Royal Irish Academy	} The Academy.
Proceedings do. do.	
Journal of the Royal Geological Society of Ireland	} The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club	} The Club.
Publications of the Royal Swedish Academy of Sciences.....	} The Academy.
Papers of the Royal University of Norway	} The University.

Bulletin of the Geological Institution of the University of Upsala	} The Institution.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhand- linger.....	} Royal Danish Society of Sciences.
Bulletin, Société Impériale, Moscow...	The Society.
“Leopoldina” Amtliches organ der Kaiserlichen, Leopoldino-Carolini- schen Deutschen Akademie der Naturforscher	} The Academy.
Mittheilungen der Kais. Königl. Geo- graphischen Gesellschaft in Wien ...	} The Society.
Memoirs of the National Academy of Sciences	} The Academy.
Report of Australasian Association for the Advancement of Science	} The Association
Journal and Proceedings of the Royal Society of New South Wales	} The Society.
Journal of the Royal Geographical Society of Australasia	} The Society.
Wealth and Progress of New South Wales	} The Agent-General.
Records of the Geological Survey of N.S.W.	} The Surveyor.
Memoirs of the Geological Survey of N.S.W.	
Annual Report and Papers of the Department of Mines and Agricul- ture, N.S.W.....	} The Department.
Prodromus of the Zoology of Victoria	The Editor.
Records of the Australian Museum Report of the Trustees of the Austra- lian Museum.....	} The Trustees.
Proceedings of the Royal Society of Queensland	} The Society.
Transactions and Proceedings of the New Zealand Institute	} The Institute.
Papers and Proceedings of the Royal Society of Tasmania	} The Society.

Proceedings and Transactions of the Royal Society of Canada, 2nd Ser., Vol. I.	}	The Society.
Proceedings of the Canadian Institute Annual Report do.	}	The Institute.
Transactions do.		
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	}	The Institute.
Annual Report, Hamilton Public Library, Ontario, Canada	}	The Librarian.
Journal and Proceedings of the Hamil- ton Association	}	The Association.
Geological and Natural History Survey of Canada	}	Department of the Interior.
Annual Report and Papers—do.		
Contributions to Canadian Palæon- tology		
Memorias de la Sociedad Científica (Mexico)	}	The Society.
“ Boletin Mensual ” Observatorio Meteorologico-Magnetico Central de Mexico	}	The Editor.
Anuario del Observations Astrón- omico Nacional, Mexico.....	}	The Astronomer.
Boletin del Observatorio Astronómico Nacional de Tacubaya	}	The Observer.
Report of the Museum National, Rio-de-Janeiro.....	}	Directeur-Général.
Archivos do.		
Cape Meridian Observations	}	Cape Astronomer-Royal.
Report of H.M. Astronomer at the Cape of Good Hope to the Secretary of Admiralty		
Transactions of the American Philo- sophical Society	}	The Society.
Proceedings do.		
United States Geological Survey, Annual Report.....	}	The Department.
Contributions to American Ethnology.		
United States Geographical and Geo- logical Survey		

United States Department of Agriculture, Publications of	The Department.
Weasels of North America	
Shrews do. do.	
Voles and Lemmings of North America	
Report of the Smithsonian Institution	The Institution.
Smithsonian Miscellaneous Collections	
Smithsonian Contributions	
Annual Reports of the Bureau of Ethnology	
Miscellaneous Publications of the Bureau of Ethnology	
Proceedings of United States National Museum	The Museum.
Report do. do.	
Bulletins do. do.	
Transactions of the Academy of Science of St. Louis	The Academy.
Proceedings of the Academy of Natural Sciences of Philadelphia...	The Academy.
Papers do. do.	
Proceedings of the American Academy of Arts and Sciences.....	The Academy
Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	The Academy.
Memoirs of the National Academy of Sciences, Washington.....	The Academy
Proceedings of the Davenport Academy of Natural Science.....	The Academy.
Transactions of the Wagner Free Institute of Science, Philadelphia ...	The Institute.
Annual Report, Transactions, and Miscellaneous Papers of the Historical and Scientific Society of Manitoba	The Society.
Annual Report of the Trustees of the Cooper Union for the Advancement of Science	The Union.
Proceedings of the Boston Society of Natural History, U.S.A.	The Society.
Memoirs do.	
Bulletins of the Essex Institute, U.S.A.	The Institute.

Annual Report of the Curator of the Museum of Comparative Anatomy, Harvard College	} The College.
Annual Report of Harvard College	
Harvard University Catalogue	The University.
Annual Report of the Chicâgo Academy of Sciences	} The Academy.
Transactions of the Astronomical Observatory of Yale University ...	
Annual Report do.	} The University.
Report of the President of Yale University	
Catalogue do. do.	
Journal of the Elisha Mitchell Scientific Society	
Tufts College Studies	The College.
Transactions of the Meriden Scientific Association	} The Association

LIST OF OFFICERS AND COUNCIL,

1897-8.

OFFICERS.

PRESIDENT	EDMUND WILSON.
VICE-PRESIDENTS. . .	{ REV. CHAS. HARGROVE, M.A. NATHAN BODINGTON, Litt.D.
HONORARY SECRETARIES .	{ ARTHUR SMITHELLS, B.Sc. E. K. CLARK, M.A., M.Inst.C.E.
TREASURER	JAMES W. OXLEY.
HONORARY CURATOR IN GEOLOGY	{ J. A. NUNNELEY, M.B.
HONORARY CURATORS IN ZOOLOGY	{ EDWARD ATKINSON, F.L.S. LOUIS C. MIALI, F.R.S.
HONORARY CURATOR IN ETHNOLOGY AND WORKS OF ART	{ J. E. EDDISON, M.D.
HONORARY LIBRARIAN .	REV. J. H. D. MATTHEWS, M.A.

The above officers, with the following gentlemen, form the
COUNCIL.

TALBOT BAINES, B.A.	THOMAS SCATTERGOOD.
JAMES E. BEDFORD, F.G.S.	T. P. TEALE, M.A., F.R.S.
T. WALTER HARDING.	J. H. WICKSTEED, M.Inst.C.E.
THOMAS MARSHALL, M.A.	J. J. WILLSON.
RICHARD REYNOLDS, F.I.C.	RICHARD WILSON.

Secretary	W. F. HUSBAND, LL.B.
Curator	HENRY CROWTHER, F.R.M.S.

LIST OF MEMBERS AND SUBSCRIBERS,

1897-8.

** Members deceased, whose shares have not been transferred.*

PROPRIETARY MEMBERS,

EXEMPT FROM ANNUAL SUBSCRIPTIONS.

2	*Aldam, Wm.	.	
3	Armitage, Robert	.	Farnley.
4	Arthington, Robert	.	Headingley.
49	Baines, Mrs. Arthur	.	The Heath, Adel.
5	*Baines, Herbert S.	.	
63	Barr, Frederick Horatio	.	North Grange Road, Headingley.
6	Barran, Sir John, Bart.	.	Chapel-Allerton Hall.
20	Battye, John	.	Birstal.
22, 24	*Beckett, W., M.P. (2 shares)		
18	Bilbrough, Alfred	.	15, Beech Grove Terrace.
8	Binks, Benj., Junr.	.	5, Park Place.
45	Braithwaite, James, M.D.	.	Clarendon Road.
9	Broadhead, Wm. Henry	.	Broomfield Crescent, Headingley.
11	*Brown, James	.	
31, 62	Brown, Wm. J. (2 shares)	.	
13, 14	Calverley, Edmd. (2 shares)	.	Oulton Hall.
15	Charlesworth, C. H.	.	6, Queensborough Terrace, Hyde Park, London, W.
16	Chorley, Mrs.	.	9, Cavendish Road.
19	Close, James William	.	Greek Street.
21	Cudworth, John W.	.	43, Mount Preston.
23	Dibb, Mrs. Elizabeth	.	
25	Eddison, John Edwin, M.D.	.	6, Park Square.
26	*Ellershaw, John	.	
28	Empson, Christopher	.	Mill Mount, York.
29, 48	Ford, J. R. (2 shares)	.	Quarrydene, Weetwood.

- 33 *Goodman, Benjamin .
- 36-8 Gott, Wm. Henry (3 shares)
- 61 Greenhow, Wm. T. . Newton Cottage, Chapel-Allerton.
- 44 Greenwood, Arthur . 8, Cavendish Road.
- 27 Hall, William . Hillside, Headingley.
- 39 *Harding, T. R. .
- 64 Harding, Thomas Walter . Tower Works, Globe Road.
- 41 Heaps, Charles Denison . Regent Villas, Cumberland Rd.
- 40 Heaps, John William . Park View Villas, Cowper Street.
- 42 Heaton, Beresford R. . 102, Lexham Gardens, Kensington, S.W.
- 30 Horsfall, J., M.A., F.R.C.S. . Cambray, Richmond Hill, Bournemouth, E.
- 47 Ingham, Constantine . 3, Belgrave Crescent, Scarbro'.
- 51 Kinnear, Thos. John, M.A. . The Abbey, Malton.
- 55 Luccock, Mrs. . The Limes, Kirkstall Lane, Leeds.
- 57 Lupton, Charles . The Harehills, Roundhay.
- 32 Lupton, Edward Basil . Moorlands, Headingley.
- 53 Lupton, Francis M., M.A. . Rockland, Newton Park.
- 56 Lupton, Sydney, M.A. . A. Audley Mansions, 44, Mount Street, London, W.
- 58 *Makins, Charles .
- 77 Marsh, John Jenks . Cressy House, Woodsley Road.
- 59 *Marshall, Arthur, F.G.S. .
- 60 *Marshall, John, M.A. .
- 66 Marshall, Reginald Dykes . Castlerigg Manor, Keswick.
- 67 Marshall, V. A. E., B.A. . Monk Coniston, Ambleside.
- 50 Mason, Charles Letch . Moorland Terrace.
- 65 Miall, Prof. Louis C., F.R.S. . Crag Foot, Ben Rhydding.
- 43 *Nelson, George Hird .
- 7 North, John . North Hill, Roundhay.
- 68 Nunneley, J. A., M.B. . 22, Park Place.
- 46 Raynar, Joseph Percival . Moorfield Lodge, Headingley.
- 69 Rhodes, John . Potternewton House.
- 70 *Shepherd, John .

- 10 Streatfeild, Richard James. The Rocks, Uckfield, Sussex.
 71 Tatham, Miss . Springfield Mount.
 52 Taylor, Benjamin . 20, Moorland Road.
 72 *Teale, Thomas Greenwood
 73 *Teale, Mrs. .
 74 Tottie, Mrs. John William
 34, 35 Truro, The Bishop of (2 shares) Trennythton, Par Station, Cornwall.
 54 Waite, James Butler . Belvidere, Newton Road.
 75 Walker, Edward . 32, Springfield Mount.
 17 Walker, Reginald Thomas 1, Furnival's Inn, Holborn, London, E.C.
 76 Ward, William . 12, Bank Street.
 12 Wilson, Rev. Benjamin . Christ Church Vicarage, Mirfield.
 78 Wilson, Edmund . Denison Hall.
 1 Wurtzburg, John Henry . 2, De Grey Road.

NEW PROPRIETARY MEMBERS,

WITH AN ANNUAL SUBSCRIPTION OF ONE GUINEA.

- 32 Atkinson, Edward, F.L.S. . Langholme, Franklin Road, Harrogate.
 113 Bailes, Richard . Ridge Villa, Meanwood Road.
 116 *Baines, Frederick .
 2 *Balme, E.B. Wheatley, M.A.
 62 Barley, D. H., M.D. . Grove House, Burmantofts.
 91 Bedford, James . Woodhouse Cliff.
 15 Bilbrough, Wm. Radford . 15, Beech Grove Terrace.
 3 Birchall, Edward . Inglemoor House, Moorland Rd.
 121 Blackburn, Henry G. . 2, East Parade.
 13 Boothman, David . Rough House, Headingley.
 4 Boothroyd, William . Grove Mill, Headingley.
 89 Boston, Richard . Boar Lane.
 10 Bowling, John . Newstead House, Spencer Place.
 49 Braithwaite, William . Throstle Nest, Horsforth.

- 5, 6 Brown, G. W. (2 shares) . 78, Belsize Park Gardens
Hampstead, London
- 1 Burrell, Benjamin A., F.I.C. 5, Mount Preston.
- 86 *Carter, J. B. .
- 9 *Chadwick, William .
- 14 Conyers, W. H. . The Hills, Ilkley.
- 45 Craven, John . 3, Beech Grove Terrace.
- 104 Crawford, John William . Newton Lane.
- 26 Dawson, Oswald . Albion Walk Chambers, Leeds.
- 19 Fairbairn, Sir Andrew . Askham Grange, near York.
- 118 Flitch, John R. . Moortown.
- 52 Fraser, Mrs. James B. . Claremont, Horsforth.
- 87 Gibson, Rev. E. C. S., D.D. Leeds Vicarage.
- 102-3 }
106-10 } Gott, William Henry (P)
114-15 } (9 shares) .
- 22 Hargrave, Charles .
- 23 *Hargrave, James .
- 7 Hargrove, Rev. C., M.A. . 10, De Grey Terrace.
- 16 Harvey, William . The Grove, Roundhay.
- 81 Hatch, S. C. .
- 44 Hepper, Mrs. J. H. . Quebec House, Harrogate.
- 51 Hoggard, Alfred . 25, Cavendish Road.
- 98 Howgate, William . 21, Blenheim Terrace.
- 36 *Hudson, Henry .
- 84 Hummel, Prof. J. J. . 152, Woodsley Road.
- 120 Ingham, Samuel . Headingley Hall.
- 56 James, Christopher William South View, Potternewton Lane.
- 96 Jepson, Edward George . 20, Springfield Mount.
- 39 Jowitt, Robert Benson . Harehills, Leeds.
- 40 Joy, William Lomas . Brentwood, Beverley.
- 43 *Kitson, James .
- 46 Kitson, J. Hawthorn . Elmete Hall, Roundhay.
- 47 Kitson, Sir Jas., Bart., M.P. Gledhow Hall.
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THE
SEVENTY-EIGHTH REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1897-8.

READ AT THE ANNUAL MEETING, MAY 3rd, 1898.

LEEDS:
JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS, ALBION STREET.
—
1898.

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REPORT OF THE COUNCIL

AT THE CLOSE OF THE

SEVENTY-EIGHTH SESSION.

The Society has held twelve General Meetings during the past Session, and the attendance of Members and Subscribers has been somewhat above the average. The Society is indebted to Mr. C. T. Whitmell, Professor A. J. Grant, and Mr. E. K. Clark for interesting lectures delivered gratuitously.

The list of Lectures is as follows:—

- 1.—“Some Aspects of Mediæval London.” By Sir WALTER BESANT.
Oct. 19th, 1897.
- 2.—“Macaulay.” By HERBERT W. PAUL. *Nov. 2nd, 1897.*
- 3.—“Travel in West Africa.” By Miss MARY KINGSLEY. *Nov. 16th, 1897.*
- 4.—“The Tower of Babel and the Confusion of Tongues.” By THEOPHILUS G. PINCHES, M.R.A.S. *Dec. 7th, 1897.*
- 5.—“Crystals and Precious Stones.” By H. A. MIERS, F.R.S. *Dec. 21st, 1897.*
- 6.—“Modern Composers of Classical Song” (with Vocal Illustrations by Miss PAULINE CRAMER). By CARL ARMBRUSTER. *Jan. 4th, 1898.*
- 7.—“Chautauqua, the Summer Lecture-City of the United States.” By OWEN SEAMAN, M.A. *Jan. 18th, 1898.*

- 8.—“The First Crossing of Spitsbergen.” By Sir W. MARTIN CONWAY.
Feb. 1st, 1898.
- 9.—“Some Curiosities of Vision.” By SHELFOED BIDWELL, M.A.,
LL.B., F.R.S. *Feb. 15th, 1898.*
- 10.—“The Grand Cañon of the Colorado of the West.” By C. T.
WHITMELL, M.A., B.Sc. *March 1st, 1898.*
- 11.—“Cardinal Richelieu.” By ARTHUR J. GRANT, M.A. *March*
15th, 1898.
- 12.—“Gibraltar.” By E. K. CLARK, M.A. *April 5th, 1898.*

The number of Members and Subscribers shows a gratifying increase, and is as follows:—

			1897.	1898.
Original Proprietary Members	...	...	57	58
New Proprietary Members	...	...	81	82
Ordinary Members	..	...	2	2
New Ordinary Members	...	...	65	61
Annual Subscribers of £1 is.	...	...	112	124
Annual Subscribers of 7s. 6d.	...	...	101	114
			<u>418</u>	<u>441</u>

During the Christmas holidays the Curator gave three Museum Lectures, illustrated with the lantern, on “Cats,” “Attack and Defence amongst Animals,” and “Pots and Pottery.” Great interest was shown in the lectures and the displays of objects from the Museum at their close. There was an average attendance of about two hundred persons, among whom were many of the Society’s Members and Subscribers.

The number of visits to the Museum and references to the specimens by collectors, undergraduates of the Victoria University, teachers of Board Schools of the City, accompanied by large classes of scholars, and by scientific men for the handling and examining of types, have been fully equal to those of past years.

A case, illustrating the various forms of Birds' Bills, with labels explaining their structure and modifications, and the habits and nature of the birds which possess such bills, has been added to the collections in the Bird Room.

In the same room a series of Birds' Eggs is being displayed in a table-case. The eggs are mounted on separate tablets, with printed labels describing their structure, form, colour, clutches, the kind of nest which held them, and other aspects of this delightful branch of ornithology.

The specimens in the table-cases illustrating "Attack and Defence amongst Animals" have been re-mounted on opaline glass, and another case has been added in which are shown many interesting examples of mimicry between animals, and the close resemblance of others to their surroundings.

The Council note with pleasure the interest shown by visitors in these and other educational cases added to the Museum in recent years.

A new General Guide to the contents of the Museum has been issued, in which are included descriptions of the later acquisitions.

The gifts to the Museum during the past year have been numerous and valuable.

Mr. F. Haverfield, M.A., Oxford, has presented a Roman milestone, which he procured at Castleford last summer. This interesting object is of rudely-dressed sandstone, irregularly oval in section, and nearly six feet high. On one side are two inscriptions, which run from opposite ends of the stone.

The Society is deeply indebted to Mr. H. Bendelack Hewetson, F.R.G.S., for the gift of a large series of Roman and Egyptian Antiquities.

The Roman objects are chiefly from Ventimiglia, and include a blue vase, two-handled cup, small ewer, basin, and several unguentaria in glass; two phialæ in Arretine ware; sepulchral urns and lamps in terra-cotta, and fragments of objects in bronze.

From Rome is a fine example of a rhyton, terminating in a ram's head.

Many of the Egyptian antiquities are from Old Alexandria, and include two beautiful examples of mummy cases, mounted in an upright glazed case of ebonized wood, a mummy hand, and a cat mummy; two figures of Osiris, head of cat, head and feet of an Ibis in bronze. Five large amphoræ, in stands of wrought-iron, vases, lekythoi, St. Menas' bottles, and lamps in terra-cotta. Porcelain amulets, sepulchral figures, necklaces, finger-rings, scarabs, and other funereal objects. Carved heads of figures in syenite and marble, a sepulchral jar in limestone, and two stone vessels from the Libyan Desert.

It is proposed to arrange all the Egyptian objects in the upright cases in the Inner Vestibule.

The Council have to acknowledge with thanks the receipt of a cheque, value two pounds twelve shillings, from the late Mr. W. H. Rinder, F.R.G.S., Burley, for the purchase of Birds' Eggs for the special display case of these objects now under arrangement in the Museum.

Mr. Edward Atkinson, F.L.S., in addition to the continued gift of the Journal of the Linnean Society, as published, has presented a fine specimen of the Emerald Cuckoo from Cape Colony, and a series of insects collected in British Columbia.

Mr. W. Marsden, Avenue House, Leeds, has sent several skins of aquatic birds, including the European Flamingo, Black-necked Swan, White-fronted Goose, Scaup Duck, Garganey, &c., some of which have been mounted and put in the bird cases.

The general gifts to the Museum include a British Stone Celt from Uttoxeter, by the Rev. T. Thistlethwaite Smith, M.A., Leeds, and a coloured Map of the district south of Rome, showing the position of Lanuvium, by Miss Moseley, of Adel.

The presents to the Library, for which the Council have to thank several gentlemen and many learned societies, include catalogues of the "Corals;" "Tertiary Mollusca," "Fossil Cephalopoda," and "Coins of the Ancients" in the British Museum, from the Trustees of that Institution; "The Invention of Printing," from the author, the Rev. Charles H. Middleton-Wake, M.A.; "A Mathematical Treatise on the Motion of Projectiles," from the author, Mr. Fras. Bashforth, B.D.; and a series of Weather Records from 1832 to 1850, from Mr. E. G. Jepson, Leeds. In addition to the usual generous gifts from the American Government and Societies, the Smithsonian Institute has sent "The History of the First Half-Century of the Smithsonian Institution," a richly-illustrated volume dealing with the administrative work of this institution from 1846 to 1896.

At the Sanitary Congress held in Leeds, in September, 1897, Mr. Richard Reynolds, F.C.S., a member of the Council, and Mr. H. Crowther, the Curator, read a joint paper, printed elsewhere in this Report, on "A Decade of Sunshine Observations in Leeds," which was drawn up from the records which have been made during the last ten years, by means of Jordan's sunshine recorders at the Museum, by the Curators; at Cliff Road, Headingley, by Mr. R. Reynolds; and at Lawnswood, Adel, by Mr. C. S. Irvine. The paper was well received, and was printed in the last issue of "The Journal of the Sanitary Institute."

During the past year considerable expense has been incurred in the cleaning, painting, distempering, and papering of the Museum, Library, and other rooms. The large doors of the Lecture Theatre have been made to swing noiselessly, adding considerably to the comfort of those who attend the meetings.

The ventilation of the Lecture Hall, which at present is far from satisfactory, is receiving attention from the Council.

During the past year the Society has received the sum of £2,000 from Messrs. Wm. Williams Brown & Co., in consideration of rights of light interfered with by the erection of the new Bank in Park Row. This sum has been invested in the names of the Trustees in Midland Railway $2\frac{1}{2}\%$ Preference Stock, and will yield an income of about £57 per annum.

*Summary of Meteorological Observations taken at the Philosophical Hall,
and at Woodhouse Cliff, Leeds, during the year 1897.*

1897.	Mean Height of Barometer (inches).	Mean Temperature (degrees).	Earth Thermometer (inches).	Amount of Rainfall.	
				Museum (inches).	Woodhouse Cliff (inches).
January	29.733	35.2	.	2.18	1.92
February	29.785	42.0	...	2.85	2.92
March	29.318	43.4	40.7	2.59	2.67
April	29.588	44.4	42.1	1.81	1.74
May	29.728	50.2	47.0	1.29	1.02
June	29.752	58.7	53.7	2.88	3.12
July	29.747	62.5	56.7	.39	.46
August	29.530	62.8	57.5	2.75	2.76
September	29.699	54.2	52.9	2.17	2.30
October	29.906	49.9	49.2	1.63	1.69
November	29.962	46.8	47.0	2.42	2.28
December	29.586	41.4	41.7	2.53	2.67
Monthly Means ...	29.694	49.2	...	25.49	25.55

Greatest fall of rain (during 24 hours)—.77 inches on February 5th. Average rainfall at the Museum for the ten years 1888—1897, 25.91 inches.

Greatest degree of heat, indicated by the thermometer in the shade—87.5° on August 5th; minimum—24° on January 23rd and December 26th.

Greatest barometric pressure—30.54 inches on December 22nd, the temperature of the mercury being 46°; least pressure—28.47 inches on March 3rd, the temperature of the mercury being 48°.

The readings of the Earth Thermometer are taken by a Symons' instrument, exposed at a depth of 2' 6" below the ground at Woodhouse Cliff, and read at 10 a.m. The monthly returns are the means of the daily readings.

The Bench Mark at the corner of the Philosophical Hall is 131.8' above the Ordnance datum, and .8' above the pavement. The cistern of the barometer is 12.8', the thermometers are 42', and the rain-gauge is 45' above the bench mark.

The Hall is situated at 1° 32' 45" or 6 min. 11 sec. W., and 53° 47' 51" N., and hence g/g_{45} is 1.000774. Taking the standard height of the barometer to be 30", and the standard temperature to be 62° F, the height of the homogeneous atmosphere is 27860'. To find the height of a barometer at sea level equivalent to a reading of 11", at a temperature of t ° F. different from 62° F., add to the reading H'' ($.0054 \mp .00001t$).

SUNSHINE AT LEEDS IN 1897.

The observations recorded below were made by Jordan's Photographic Sunshine Recorder at the following stations in Leeds:—

1. The Museum of the Philosophical and Literary Society, situate in the centre of the city; elevation above the sea, 145 feet.
2. Woodhouse Cliff, $\frac{1}{2}$ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb.
3. Lawnwood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the city.

Months.	Stations.	Hours of sunshine registered.
JANUARY	1	25'25
	2	39'50
	3	51'10
FEBRUARY	1	34'40
	2	47'10
	3	48'15
MARCH	1	81'25
	2	100'30
	3	107'40
APRIL	1	133'05
	2	159'10
	3	167'25
MAY	1	209'15
	2	235'20
	3	247'25
JUNE	1	145'20
	2	149'40
	3	164'30
JULY	1	227'50
	2	231'55
	3	242'25
AUGUST	1	190'35
	2	196'05
	3	206'45
SEPTEMBER	1	122'40
	2	130'25
	3	146'10
OCTOBER	1	66'45
	2	73'40
	3	86'25
NOVEMBER	1	11'55
	2	15'35
	3	21'20
DECEMBER	1	7'20
	2	11'35
	3	14'15

SUMMARY FOR THE YEAR.

	Hours recorded.		Difference from mean of 10 years.	Per cent. of possible duration.
	Hours.	Mins.	H. M.	
Museum ..	1,256	15	..	28'45
Woodhouse Cliff	1,399	55	..	31'71
Lawnwood ..	1,503	45	..	34'06
31'40 per cent. mean for 1897.				27'5 per cent. mean for 1892.
26'5 ..	1896.			..
37'5 ..	1895.			..
29'0 ..	1894.			..
31'6 ..	1893.			..
26'7 per cent. mean for ten years.				

The Meteorological Office publishes the following records of sunshine for 1897, as observed at stations taken as representing specified districts:—

Stations.	Number of Hours.	Difference from mean.	Percentage of possible duration.
Scotland, N. (Stornoway, &c.)	1,237	.. +188	.. 28
.. E. (Aberdeen, Marchmont)	1,350	.. + 82	.. 31
.. W. (Glasgow; Douglas, Isle of Man) ..	1,397	.. + 24	.. 31
England, N.E. (Durham, York)	1,428	.. +146	.. 32
.. N.W. (Stonyhurst, Blackpool, Llandudno)	1,512	.. +140	.. 34
.. Mid. (Cirencester, Oxford, &c.)	1,508	.. +138	.. 35
.. S. (London, Hastings, Southampton, &c.)	1,692	.. + 99	.. 39
.. E. (Hillingdon, Geldestone, Cambridge)	1,601	.. + 82	.. 37
.. S.W. (Pembroke, Falmouth, Plymouth, &c.)	1,636	.. - 2	.. 38
Ireland, N. (Armagh, Markree Castle)	1,287	.. + 28	.. 30
.. S. (Dublin, Parsonstown, Valencia) ..	1,430	.. - 2	.. 33
Channel Islands (Jersey)	1,738	.. -101	.. 41

SUMMARY.

34'1 per cent. mean for United Kingdom, 1897.	35'2 per cent. mean for United Kingdom, 1892.
31'8 ..	32'6 ..
35'8 ..	30'7 ..
31'1 ..	29'2 ..
37'0 ..	27'5 ..
or 32'5 per cent. mean for ten years.	

"A Decade of Sunshine Observations at Leeds," by HENRY CROWTHER, F.R.M.S., and R. REYNOLDS, F.C.S.

Ten years ago the Leeds Philosophical and Literary Society added daily records of sunshine to its meteorological observations. The system selected was that invented by Mr. Jordan, and it has proved satisfactory in the facility with which it is carried out. A strip of paper, prepared by a modified ferrocyanide method, is placed in a dark box having small slits on two opposite sides. The box is fixed facing due south on the top of a building, or some other position commanding a clear horizon. When there is direct sunlight the slit having an eastern aspect admits its ray from sunrise until noon, and the same happens from the western slit from noon until sunset. When the paper is removed a dark blue track is found where the sun's rays have impinged upon it. This track is fixed and made permanent by simply washing off the excess of the sensitive salt with cold water. As the paper is ruled with transverse lines to show the hours and their subdivisions, and only direct sunlight produces the dark track, the measurement of this for the day is easily reckoned.

It was obvious that the area of the city would include localities varying in the amount of sunshine which they enjoyed, and the following three stations were selected for observations, viz. :—

1. The Museum, situate in the centre of the city ; elevation above the sea, 145 feet. Observer, Mr. Henry Crowther.
2. Woodhouse Cliff, one-and-a-half miles north-west from the centre of the city ; elevation, 330 feet ; residential suburb. Observer, Mr. R. Reynolds.
3. Lawnswood Cemetery, Adel, four miles north-west from the centre of the city ; elevation, 475 feet ; on the fringe of the city. Observer, Mr. C. S. Irvine.

It was soon found that the results from these stations maintained fairly constant proportions, but the science of meteorology demands long-continued observations before giving factors that can be satisfactorily compared.

Table A. gives the hours of bright sunshine registered during the ten years 1887 to 1896.

TABLE A.

YEARS.	MUSEUM.	WOODHOUSE CLIFF.	ADEL.
	H. M.	H. M.	H. M.
1887	1,115'03	1,325'55	1,396'18
1888	720'26	944'59	1,021'24
1889	729'35	965'14	1,131'44
1890	851'05	1,128'50	1,242'15
1891	810'55	1,002'05	1,160'30
1892	978'10	1,243'25	1,417'10
1893	1,223'15	1,437'10	1,580'35
1894	1,174'55	1,313'05	1,417'00
1895	1,530'00	1,672'30	1,821'30
1896	1,007'00	1,217'00	1,324'05
	10,140'24	12,250'13	13,512'31

Deficiency of Museum from Adel: mean percentage of ten years, 25'4.

Deficiency of Woodhouse Cliff from Adel: mean percentage of ten years, 9'4.

The recording station at Adel has been selected under the belief that the sunshine there is but little obstructed by the smoke of the city, and that Adel consequently represents the type of the normal atmosphere of the locality. Woodhouse Cliff is about halfway between Adel and the Museum, and its records of sunshine are nearly always intermediate between those of the two other stations.

When the observations had been continued for a year or two, they were re-cast, in order to distinguish any differences between the records of Sundays and working-days. These are shown on Table B.

TABLE B.

	MUSEUM.		WOODHOUSE CLIFF.		ADEL.	
	Sundays.	Mean of other days.	Sundays.	Mean of other days.	Sundays.	Mean of other days.
1887	H. M. 172'54	H. M. 157'01	H. M. 196'20	H. M. 188'16	H. M. 212'08	H. M. 197'21
1888	135'55	97'25	170'41	129'03	184'40	139'27
1889	97'15	105'23	115'10	141'40	131'07	166'46
1890	164'05	114'30	204'25	154'04	208'55	172'13
1891	128'25	113'45	137'05	144'10	152'25	168'01
1892	181'20	132'48	211'30	171'59	214'50	200'23
1893	209'55	168'53	232'05	200'51	243'00	222'56
1894	167'20	167'56	180'30	188'46	188'50	204'41
1895	262'40	211'13	284'50	231'16	292'10	254'53
1896	173'15	138'57	198'25	169'46	208'55	185'51

Mean percentage for ten years 1887 to 1896:—

	MUSEUM.		WOODHOUSE CLIFF.		ADEL.	
Sundays	...	169'1	...	193'0	...	203'4
Mean of other days	...	140'4	...	171'6	...	191'1

Deficiency of Museum from Adel: Sundays, 16'8; other days, 26'7.

Deficiency of Woodhouse Cliff from Adel: Sundays, 4'0; other days, 10'5.

It is thus seen that on days other than Sundays the normal sunshine of Adel loses 26'7 per cent. at the Museum, and 10'5 per cent. at the intermediate station of Woodhouse Cliff. On Sundays the loss is less, being 16'8 per cent. at the Museum, and 4'0 per cent. at Woodhouse Cliff. Truly, here is a new reason for calling the first day of the week Sun Day. Some readers of these results will be likely to feel surprise that the practical cessation of manufacturing smoke for about thirty-six hours should not produce a greater improvement in the sunshine of the central station. But, putting aside any preconceived ideas, we must accept the fact that the agencies still operative on Sundays are responsible for 16'8 per cent. of the diminished sunshine. These are, firstly, the natural haze of a valley station with its river, and secondly—and chiefly—the products of the burning of coal for domestic purposes. We shall recognise that the producer of manufacturing smoke has in a large number of cases brought science to his aid in diminishing the amount of

unconsumed carbon which he throws into the atmosphere, and that he reaps the reward of this good deed. On the other hand, the householder with his tens of thousands of fireplaces has had little done for him in guidance towards the same laudable object. The use of gas as a fuel for domestic purposes may be extended in the future, and would work for our object. But much is possible in the arrangements for burning coal for domestic use, and Leeds is justly proud of the contribution to solving the problem made by our fellow-citizen, Mr. T. Pridgin Teale, F.R.S., &c., in the fireplaces that bear his name.

It may be of interest that the actual figures for each day of the week should be recorded. This is done in Table C. :—

TABLE C.
Museum.

	SUN.	MON.	TUES.	WED.	THURS.	FRI.	SAT.
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
1887	172'54	165'31	181'40	136'38	167'02	123'07	168'11
1888	135'55	77'29	115'51	89'04	124'16	92'11	85'40
1889	97'15	117'10	104'15	113'05	106'00	84'45	107'05
1890	164'05	103'50	101'05	122'30	95'25	133'55	130'15
1891	128'25	119'00	96'25	134'20	105'20	120'40	106'45
1892	181'20	146'30	109'00	118'20	124'35	148'50	149'35
1893	209'55	182'40	152'15	183'40	171'50	155'00	168'10
1894	167'20	148'15	162'50	125'00	210'30	162'40	198'20
1895	262'40	219'00	201'00	199'00	185'40	235'50	225'50
1896	173'15	166'30	161'10	115'45	139'05	133'50	117'25
Total ...	1,693'04	1,445'55	1,385'31	1,337'22	1,429'43	1,390'48	1,457'16
Mean ...	169'18	144'35	138'33	133'44	142'58	139'04	145'44

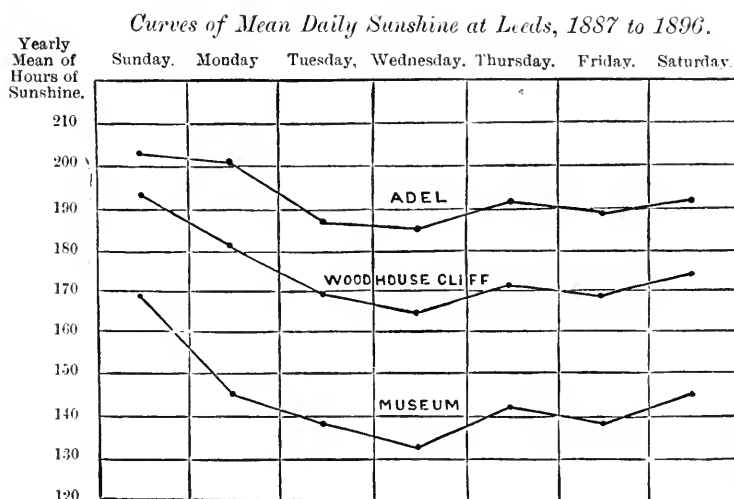
Woodhouse Cliff.

	SUN.	MON.	TUES.	WED.	THURS.	FRI.	SAT.
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
1887	196'20	191'07	220'35	167'10	197'58	152'42	200'03
1888	170'41	123'51	143'58	122'59	150'44	117'17	115'29
1889	115'10	148'55	135'10	144'52	140'55	130'12	150'00
1890	204'25	148'15	143'30	163'55	128'55	167'55	171'55
1891	137'05	156'30	123'50	154'35	138'10	154'15	137'40
1892	211'30	192'10	143'40	153'45	163'55	192'25	186'00
1893	232'05	216'20	185'05	214'25	197'20	191'30	200'25
1894	180'30	173'50	191'40	143'25	228'50	173'55	220'55
1895	284'50	250'00	226'50	224'10	205'00	251'40	230'00
1896	198'25	205'05	184'35	161'40	161'50	161'40	143'45
Total ...	1,931'01	1,806'03	1,698'53	1,650'56	1,713'37	1,693'31	1,756'12
Mean ...	193'06	180'36	169'53	165'05	171'21	169'21	175'37

Adel.

	SUN.	MON.	TUES.	WED.	THURS.	FRI.	SAT.
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
1887	212'08	202'33	219'53	183'36	197'57	172'13	207'58
1888	184'40	134'03	151'37	132'09	159'50	122'03	137'02
1889	131'07	178'25	158'35	171'55	167'50	161'27	162'25
1890	208'55	169'25	173'20	180'35	140'30	180'55	188'35
1891	152'25	182'05	144'20	183'05	159'55	180'35	158'05
1892	214'50	217'35	186'25	183'35	191'25	211'30	211'50
1893	243'00	236'20	197'15	232'40	236'30	210'05	224'45
1894	188'50	181'50	204'00	173'10	247'30	202'40	219'00
1895	292'10	276'30	248'30	243'50	236'00	265'40	258'50
1896	208'55	230'30	198'30	176'50	176'35	186'55	145'50
Total ...	2,037'00	2,009'16	1,882'25	1,861'25	1,914'02	1,894'03	1,914'20
Mean ...	203'44	200'55	188'14	186'08	191'24	189'24	191'26

Over-refinement in theorising upon these data is needless, but the partial improvement of the central station on Saturdays is clear, as is one on Thursday, probably due to the Wednesday half-holiday of those tradespeople who must attend to their businesses on the Saturday. These improvements are best shown by the following diagram, drawn from the means given on Table C., of the "Curves of Mean Daily Sunshine at Leeds, 1887 to 1896"—



For better or worse? The records of sunshine already given are the results of more than 10,000 observations, and their interest to many will be prospective rather than retrospective. By a slow and patient process of collecting present facts we are in possession of data giving a "value" for the atmospheric pollution of ten years. Are we improving or deteriorating? If the same influences operate in the same way, we ought to find that the increase of population and of manufactories during the period would have the effect of making worse what was bad before. The population of Leeds in 1887 may be taken as about 350,000; in 1896 it was assumed to be 400,000.

If our atmosphere holds its own against this increasing stress and strain it is something to the good. In constructing Table D for the purpose of a reply to this question, we have preferred to take for comparison five periods of two years each.

TABLE D.

	MUSEUM.	WOODHOUSE CLIFF.	ADEL.
	H. M.	H. M.	H. M.
1887 \			
1888 /	1,835'29	2,270'54	2,417'42
1889 \			
1890 /	1,580'40	2,094'04	2,373'59
1891 \			
1892 /	1,789'05	2,245'30	2,577'40
1893 \			
1894 /	2,398'10	2,750'15	2,997'35
1895 \			
1896 /	2,537'00	2,889'30	3,145'35

Deficiency of Museum from Adel:—

1887-88	...	24'0 per cent.
1889-90	...	33'4 "
1891-92	...	30'5 "
1893-94	...	20'0 "
1895-96	...	19'3 "

or a mean deficiency on ten years of 25'4 per cent.*

* The Sunshine Records, at the Museum during 1897, show a striking improvement in comparison with Adel, the mean deficiency of 1895-96 being 19'3 per cent., that of 1897, 16'5 per cent. During many months of this period a great engineering strike led to the closing of many of the large workshops of the city, so that probably when the mean of a two-year period is taken, say 1897 and 1898, a period similar to those on which

Our answer may be considered satisfactory and encouraging. The last two-year period places the atmosphere of the central station in a better position than any of the four preceding two-year periods, and this has occurred in spite of the steady increase of both population and buildings in the city. Whilst regarding these results as encouraging, we feel that their legitimate application is as a stimulus to further endeavours to attain the blessing of a purer atmosphere.

We hope that the present paper has been successful in showing that a method of sunshine recording, adopted by hundreds of observers throughout Britain, and recognised by the Authorities of the Meteorological Office, as proved by the inclusion of many records by the Jordan instrument in its Weekly Weather Report, may prove a valuable means of estimating not only the actual, but the relative, pollution by smoke of a town's atmosphere. The method is simple and inexpensive. The records are permanent, and available for confirmation or refutation if needed, and they may be compared with abundant observations in other places. The adoption of a normal station just outside the corrupted atmosphere, and the study of the facts observed in relation to days of greater or smaller activity of manufacturing operations, are the points on which we venture to think that our method has novelty.

It is proper to state that all the sunshine papers when fixed and washed are sent weekly to the central station at the Museum, where their respective values are computed by the same person, and the figures appear in the Weekly record published in the local newspapers.

the previous deficiencies, as compared with Adel, were calculated, the deficiency may be greater than stated for 1897 only.

Sunshine :—

	MUSEUM.	WOODHOUSE CLIFF.	ADEL.
	Hours.	Hours.	Hours.
Half of last two-year period, 1895-96 ...	1,268	1,445	1,573
During 1897	1,256	1,400	1,503

Deficiency of Museum from Adel :—

Half of last two-year period, 1895-96 ...	19.3 per cent.
One-year period, 1897 ...	16.5 „

"The Roman Milestone, found at Castleford, now in the Leeds Museum," by F. HAVERFIELD, M.A., F.S.A.

The Roman Milestone, which is the subject of the following note, was found in or about 1880 at Castleford. The place of the discovery was near the south end of Beancroft Road, just at the junction of that road and Beancroft Street; the occasion was the laying of a public drain four or five feet below the surface. Beancroft Road almost exactly overlies a piece of Roman road, a part, namely, of the great highway often though erroneously called Watling Street, which led from York past the "stations" of Tadcaster, Castleford, and Doncaster to Lincoln. The milestone must, therefore, have been found very close to a Roman road, and, in all probability, very close to its original position. The "station" at Castleford occupied the site of the present All Saints' Church and Rectory and Castle-house, close to the River Aire, just half-a-mile north of the place where the milestone was found. The stone came into the possession of Mr. Joseph H. Brewerton, formerly town-surveyor of Castleford, now of Glen Road, Boscombe, and was set up by him in the garden of his father's house, situate between Beancroft Street and Love Lane, and then called Storrsville; the ordnance map calls it Storesvilla, and it is now known as Lansdown Villa: it is about 100 yards from the spot where the stone was unearthed. Here I found it in September, 1897, purchased it, and presented it to the Leeds Museum. I have to thank Mr. W. E. Garforth, of Halesfield, Normanton, Mr. R. Birdsall, of Northampton, and Mr. Brewerton for information concerning the stone, communicated to me at various times before 1897.

The stone is a block of sandstone, about five feet long and ten inches in diameter. It bears two inscriptions, one at each end. When first erected, in the reign of the Emperor Decius Traianus (A.D. 249—251), it was inscribed with his name and titles. After his death, it was inverted and reinscribed at the other

end with the names and titles of his successors, the conjoint emperors, Vibius Gallus and Vibius Volusianus (A.D. 251—253). The inscriptions were first published from an imperfect copy by the late Mr. W. T. Watkin, of Liverpool, in the "Academy" for Feb. 28th, 1885, and in the "Archæological Journal" xlii. (1885), p. 154: I reprinted his readings in the "Ephemeris Epigraphica" (vii. nos. 1104, 1105). I have now been able to examine the stone myself, and have been aided by squeezes which Mr. H. Crowther, Curator of the Leeds Museum, has made for me.

The inscriptions appear to be as follows:—

(a) IMPC	and	(b) IMPP
CMQ		CCVIBIO
DECIO		GALLOETCV
FCM		VOLVSIA
5 QFRV		5 NOPF
CO		AVGG EB
		MPXX

The third, fourth, and fifth lines of (a) are indistinct, and there may have been one or two numerals after or below XX (XXI or XXII) at the end of (b). Provisionally, one may expand, thus:—

(a) *Imp(eratore) C(aesare) C. M(essio) Q(uinto) Decio*: what follows may contain his son's name, Etruscus.

(b) *Imp(eratoribus) C(aesaribus) C. Vibio Gallo et C. V(ibio) Volusiano p(iis) f(elicibus) Aug(ustis), Eburaco m(illia) p(assuum) XX..*

The indication of distance from Eburācum (York) is interesting. By the line of the Roman road through Tadcaster and Aberford, the distance from York to Castleford is about twenty English miles. The Itinerary gives twenty-one Roman miles (pp. 475, 478 Wess.). The Roman mile was a trifle shorter than the English mile, so that the agreement is fairly close. It will be even closer, if we assume that our milestone was the

twenty-second, and that the twenty-first milestone stood half a mile north of Castleford "station," just as this stands half a mile south. In that case, the actual distance from York to Castleford would have been, by the Roman road, twenty-one and a half Roman miles.

The streets and sites in Castleford mentioned above may be conveniently seen on the twenty-five inch maps of the Ordnance Survey for the West Riding of Yorkshire, No. CCXXXIV. 7 and 11.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Payments for the year 1897-8.

RECEIPTS.			PAYMENTS		
	£	s. d.		£	s. d.
To Balance in hand, May 1st, 1897 ...	...	0 17 7	By Balance Due to Bank, May 1st, 1897	...	0 12 2
" Annual Subscriptions, viz.:-			" Repairs and Alterations	144	0 3
76 New Proprietary Members, at 21s. ...	79	16 0	" Rates and Taxes	20	13 10
2 Original Ordinary " 42s. ...	4	4 0	" Fire Insurance	12	10 0
58 New Ordinary " 21s. ...	60	18 0	" Coals, &c. ...	19	18 7
120 Annual Subscribers, at 21s. ...	126	0 0	" Gas and Water	23	3 1
108 Annual Subscribers, at 7s. 6d. ...	40	10 0	" Cleaning	10	10 6
" Arrears ...	3	3 0		230	16 3
Rent, viz.:-		314 11 0	" Salaries and Wages	307	1 0
Cellars ...	40	0 0	" Fee to Auditors	2	2 0
Lecture Room ...	176	1 6		309	3 0
				34	4 4
" Receipts from Visitors to Museum		216 1 6	" Collections, Library, and Scientific Apparatus		
" Sale of Guides ...		97 9 6	" Postages	9	12 0
" Bank Interest on Deposit ...	2	12 4	" Advertising and Printing	33	12 8
" Balance on Investment of £2,000	36	8 6	" Lectures	92	5 5
" Sundries ...	0	14 9	" Bank Commission	0	9 0
	3	14 9	" Sundries	15	6 6
" Sale of Forfeited Shares ...		43 10 4	" Electric Light Supply		151 5 7
" Balance due to Bank		15 0 0	" Balance in hand		4 1 11
		43 12 11			0 19 7
		£731 2 10			£731 2 10

We have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.
LEEDS, May 16th, 1898.

BEEVERS & ADGIE,
CHARTERED ACCOUNTANTS.

CAPITAL ACCOUNT.

	£	s. d.		£	s. d.
Amount received as Compensation for Lights ...	2000	0 0	Invested in £2,270 Preference 2½% Midland Railway Stock	1999	5 3
			Balance carried to Income Account, above	...	0 14 9
		£2000 0 0			£2000 0 0

LIST OF DONATIONS AND ADDITIONS

TO THE

SOCIETY'S MUSEUM AND LIBRARY.

1897-8.

ZOOLOGY.

Emerald Cuckoo (<i>Chrysococcyx smaragdineus</i>); from Cape Colony	} Mr. Edward Atkinson, F.L.S., Harrogate.
A small series of Insects collected in British Columbia.....	

Skins of Black-necked Swan (<i>Cascaroba melanocephala</i> ; European Flamingo (<i>Phenicopterus anti-quorum</i>); Garganey (<i>Querquedula circia</i>); Scaup Duck (<i>Fuligula marila</i>); White-fronted Goose (<i>Anser albifrons</i>).....	} Mr. W. Marsden, Avenue House, Leeds.

Osteological preparation of the Head of a Guinea Fowl (<i>Numida meleagris</i>).....	} R. J. Gawler, Medical School, Leeds.

Specimen of Butterfly (<i>Doritis apollo</i>), from Trollhattan, Sweden	} Mr. W. S. Cameron, Leeds.

Cheque of the value of £2 12s. od., for the purchase of a series of Birds' Eggs for display in the Museum	} The late Mr. W. H. Rinder, F.R.G.S., Burley.

MINERALOGY.

Nodule of Clay Ironstone in blue bind, from West Riding Colliery, Altofts }	Mr. W. E. Garforth, F.G.S., Halesfield, Normanton.
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ARCHÆOLOGY & ETHNOLOGY.

A large series of Roman and Egyptian Antiquities, many of which were collected by the donor at Ventimiglia and Old Alexandria:—

Ventimiglia: Blue glass vase with calcined bones, ring and coin; two-handled glass cup, small ewer, basin, and several unguentaria in glass; phialæ in Arretine ware; lekythoi and lamps in terra-cotta; and fragments of objects in bronze.....

Five large amphoræ in stands of wrought-iron; lekythoi, vases, St. Menas' pilgrim-bottles, lamps, chiefly Coptic; Shells (*Murex* and *Ampullaria*); spatula for inlaying; fragments of chalcedony, and small objects in glass from Old Alexandria

One-handed terra-cotta vase from the Nile Delta; syenite cores from sarcophagi from the Pyramids; Coptic lamps in terra-cotta, and vases of stone from the Libyan Desert; cartouch and heads of figures in syenite, sepulchral jar, with jackall-head cover in limestone, blue mummy beads in glass, amulets, mummy figures, scarabs, necklaces and rings in porcelain. Figures of Osiris, bracelets, head and feet of Ibis in bronze

Two Mummy-cases, mummy hand, and cat mummy, displayed in an upright ebonised glass-case

Rhyton, terminating in a ram's head, from Rome; bronze smelting pot from excavation at the Abbey of St. Victa, Marseilles

Mr. H. Bendelack Hewetson, F.L.S., F.R.G.S.,
Leeds.

British stone celt from neighbourhood of Uttoxeter	{	The Rev. T. Thistlethwaite
		Smith, M.A., Virginia Road, Leeds.

Roman milestone found at Castleford { F. Haverfield, M.A., F.S.A.,
Christ Church, Oxford.

Coloured Map of the district south
of Rome } Miss Moseley, Adel.

PUBLICATIONS.

Catalogue of Welwitsch's African Plants, Part I.	} The Trustees of the British Museum.	
Catalogue of the Fossil Cephalopoda, Part III.		
Catalogue of the Tertiary Mollusca, Pt. Australia		
Guide to the Fossil Invertebrates and Plants		
Guide to the Fossil Mammals and Birds		
Guide to the Fossil Reptiles and Fishes		
Catalogue of the Madreporian Corals, Vol. III.	} The Author.	
Metastasis, by Wm. R. Tomlinson, late Rector of Sherfield English, Southampton		
The History of the First Half-Century of the Smithsonian Institution, 1846—1896		} The Institution.
The Invention of Printing, a series of four lectures delivered at Cam- bridge, in the Lent Term of 1897...		
The History of the Pianoforte		} The Author, Rev. C. H. Middleton-Wake, M.A.
Mathematical Treatise on the Motion of Projectiles		
Tables of remaining Velocity, Time of flight, and Energy of various Projectiles	} The Author, Francis Bash- forth, B.D.	
Experiments made with the Bashforth Chronograph		
A Decade of Sunshine Observations in Leeds, by Henry Crowther, F.R.M.S., and R. Reynolds, F.C.S. }	} The Authors.	
Official handbook of the Dominion of Canada		} The Canadian High Com- missioner, London.

Year-book of the Royal Society, } 1896-97 and 1897-8	The Royal Society. The Author, Theo. G. Pinches, M.R.A.S.
Notes on some recent discoveries in } the Realm of Assyriology.....	
The Babylonian Chronicle.....	
The Lament of the Daughter of Sin..}	

PERIODICALS.

WEEKLY.

Nature	Purchased.
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MONTHLY.

Annals and Magazine of Natural } History.....	Purchased.
Geological Magazine	
Journal of the Chemical Society	Purchased.
Monthly Notices of the Royal Astro- } nomical Society	The Society.
Philosophical Magazine and Journal } of Science	

BI-MONTHLY.

Journal of the Royal Microscopical } Society	The Society.

QUARTERLY.

Quarterly Journal of Microscopical } Science	Purchased.
Quarterly Journal of Geological Society	
Quarterly Returns of Marriages, } Births, and Deaths.....	Registrar-General.
Journal of the Anthropological } Institute	
Zeitschrift für Wissenschaftliche Zoo- } logie	Purchased.
Journal of the Linnean Society	
	Mr. Edward Atkinson, F.L.S.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions.....	Purchased.
Proceedings of the Royal Society ...	The Society.
Proceedings of the Royal Institution } of Great Britain	The Institution.
Publications of the Ray Society	Purchased.
Abridgments of Specifications for } Patents, Period 1884—88 ; 1889—92 }	The Comptroller - General of Patents.
British Association Report.....	The Association.
Greenwich Observations.....	The Astronomer-Royal.
Memoirs of the Royal Astronomical } Society	The Society.
Radcliffe Astronomical and Meteor- } ological Observations	Radcliffe Trustees.
Symons's British Rainfall, 1896	Purchased.
Monograph of the Palæontographical } Society	Purchased.
Proceedings of the Yorkshire Geological } and Polytechnic Society.....	The Society.
Transactions of the Leeds Geological } Association	The Association.
Proceedings of the Liverpool Geo- } logical Society.....	The Society.
Journal of the Liverpool Geological } Association	The Association.
Natural History Transactions of } Northumberland, Durham, and } Newcastle-upon-Tyne.....	The Tyneside Naturalists' Field Club.
Proceedings of the Birmingham Philo- } sophical Society	The Society.
Annual Report of the Yorkshire } Philosophical Society	The Society.
Transactions of the Leicester Literary } and Philosophical Society	The Society.
Report of the Committee of Leicester } Town Museum	The Museum.
Report of the Royal Institution, Hull	The Institution.
Report of the Meteorological Depart- } ment of the Borough of Southport. }	The Meteorological Ob- server.

Annual Report of the Brighton Town Museum	}	The Museum.
Annual Report, Middlesex Hospital...	}	The Hospital.
Annual Report of the Birkenhead Literary and Scientific Society	}	The Society.
Proceedings of the Liverpool Literary and Philosophical Society	}	The Society.
Annual Report and Proceedings of the Liverpool Science Students' Association	}	The Association.
Memoirs and Proceedings of the Man- chester Literary and Philosophical Society	}	The Society.
Transactions of the Manchester Geo- logical Society	}	The Society.
Reports of the Manchester Museum Handbooks do. do.	}	The Keeper.
Annual Report of the Sheffield Literary and Philosophical Society	}	The Society.
Annual Report of the Chester Society of Natural Science and Literature	}	The Society.
Transactions of the Leeds Naturalists' Club and Scientific Association.....	}	The Association.
Journal of the Royal Institution of Cornwall	}	The Institution.
Annual Report of the Royal Cornwall Polytechnic Society.....	}	The Society.
Report of Associated Architectural Societies	}	The Association.
Journal of the Chester Archaeological and Historic Society	}	The Society.
Geological Record	}	Purchased.
Transactions of the Yorkshire Natural- ists' Union ..	}	The Union.
Proceedings of the Royal Society of Edinburgh	}	The Society.
Transactions do. do.	}	
Transactions of the Edinburgh Geo- logical Society.....	}	The Society.

Proceedings of the Glasgow Philoso- phical Society	} The Society.
Proceedings of the Berwickshire Naturalists' Club	} The Club.
Scientific Proceedings of the Royal Dublin Society.....	} The Society.
Scientific Transactions do.	
Transactions of the Royal Irish Academy	} The Academy.
Proceedings do. do.	
Journal of the Royal Geological Society of Ireland	} The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club }	} The Club.
Publications of the Royal Swedish Academy of Sciences.....	} The Academy.
Papers of the Royal University of Norway	} The University.
Bulletin of the Geological Institution of the University of Upsala	} The Institution.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhand- linger.....	} Royal Danish Society of Sciences.
Bulletin, Société Impériale, Moscow...	} The Society.
"Leopoldina" Amtliches organ der Kaiserlichen, Leopoldino-Carolini- schen Deutschen Akademie der Naturforscher	} The Academy.
Mittheilungen der Kais. Königl. Geo- graphischen Gesellschaft in Wien ...}	} The Society.
Memoirs of the National Academy of Sciences	} The Academy.
Report of Australasian Association for the Advancement of Science.....	} The Association.
Journal and Proceedings of the Royal Society of New South Wales	} The Society.
Journal of the Royal Geographical Society of Australasia	} The Society.
Wealth and Progress of New South Wales	} The Agent-General.

Records of the Geological Survey of New South Wales	} The Surveyor.
Memoirs of the Geological Survey of New South Wales	
Annual Report and Papers of the Department of Mines and Agriculture, New South Wales	} The Department.
Prodromus of the Zoology of Victoria	
Records of the Australian Museum	} The Trustees.
Report of the Trustees of the Australian Museum.....	
Proceedings of the Royal Society of Queensland	} The Society.
Queensland Agricultural Journal	
Annals of the Queensland Museum, No. I.....	} The Trustees.
Transactions and Proceedings of the New Zealand Institute	
Papers and Proceedings of the Royal Society of Tasmania	} The Society.
Proceedings and Transactions of the Royal Society of Canada	
Proceedings of the Canadian Institute	} The Institute.
Annual Report do.	
Transactions do.	
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	} The Institute.
Annual Report, Hamilton Public Library, Ontario, Canada	
Journal and Proceedings of the Hamilton Association	} The Association.
Geological and Natural History Survey of Canada	
Annual Report and Papers—do.	} Department of the Interior.
Contributions to Canadian Palaeontology	
Bulletin of the Natural History Society of New Brunswick.....	} The Society.
Memorias de la Sociedad Científica (Mexico)	

“ Boletin Mensual ” Observatorio Meteorologico-Magnetico Central de Mexico	}	The Editor.
Annuario del Observations Astrón- omico Nacional, Mexico.....		
Boletin del Observatorio Astronómico Nacional de Tacubaya	}	The Astronomer.
Report of the Museum National, Rio-de-Janeiro.....		
Archivos do.	}	Directeur-Général.
Cape Meridian Observations		
Report of H.M. Astronomer at the Cape of Good Hope to the Secretary of Admiralty	}	Cape Astronomer-Royal.
Transactions of the American Philo- sophical Society		
Proceedings do.	}	The Society.
United States Geological Survey, Annual Report.....		
Contributions to American Ethnology. United States Geographical and Geo- logical Survey	}	The Department.
United States Department of Agricul- ture, Publications of		
Some Common Birds in their relation to Agriculture	}	The Department.
Report of the Smithsonian Institution Smithsonian Miscellaneous Collections Smithsonian Contributions		
Annual Reports of the Bureau of Ethnology	}	The Institution.
Miscellaneous Publications of the Bureau of Ethnology		
Proceedings of United States National Museum	}	The Museum.
Report do. do.		
Bulletins do. do.	}	The Academy.
Transactions of the Academy of Science of St. Louis		
Proceedings of the Academy of Natural Sciences of Philadelphia...	}	The Academy.
Papers do. do.		

Proceedings of the American Academy of Arts and Sciences.....	} The Academy.
Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	} The Academy.
Memoirs of the National Academy of Sciences, Washington.....	} The Academy.
Proceedings of the Davenport Acad- emy of Natural Science.....	} The Academy.
Transactions of the Wagner Free Institute of Science, Philadelphia ...	} The Institute.
Annual Report, Transactions, and Mis- cellaneous Papers of the Historical and Scientific Society of Manitoba	} The Society.
Annual Report of the Trustees of the Cooper Union for the Advancement of Science	} The Union.
Proceedings of the Boston Society of Natural History, U.S.A.	} The Society.
Memoirs do.	} do.
Bulletins of the Essex Institute, U.S.A.	} The Institute.
Annual Report of the Curator of the Museum of Comparative Anatomy, Harvard College	} The College.
Annual Report of Harvard College	} do.
Harvard University Catalogue	} The University.
Annual Report of the Chicago Academy of Sciences.....	} The Academy.
Transactions of the Astronomical Observatory of Yale University ...	} The University.
Annual Report do.	
Report of the President of Yale University	
Catalogue do. do.	
Journal of the Elisha Mitchell Scientific Society	} The Society.
Tufts College Studies.....	} The College.
Transactions of the Meriden Scientific Association	} The Association.

LIST OF OFFICERS AND COUNCIL,

1898-9.

OFFICERS.

PRESIDENT	NATHAN BODINGTON, Litt.D
VICE-PRESIDENTS.	{ REV. CHAS. HARGROVE, M.A. EDMUND WILSON.
HONORARY SECRETARIES	{ ARTHUR SMITHELLS, B.Sc. E. K. CLARK, M.A., M.Inst.C.E.
TREASURER	JAMES W. OXLEY.
HONORARY CURATOR IN GEOLOGY	} J. A. NUNNELEY, M.B.
HONORARY CURATORS IN ZOOLOGY	{ EDWARD ATKINSON, F.L.S. LOUIS C. MIALI, F.R.S.
HONORARY CURATOR IN ETHNOLOGY AND WORKS OF ART	} J. E. EDDISON, M.D.
HONORARY LIBRARIAN	REV. J. H. D. MATTHEWS, M.A.

The above officers, with the following gentlemen, form the
COUNCIL.

JAMES E. BEDFORD, F.G.S.	THOMAS SCATTERGOOD.
T. WALTER HARDING.	T. P. TEALE, M.A., F.R.S.
THOMAS MARSHALL, M.A.	J. H. WICKSTEED, M.Inst.C.E.
HENRY JOHN PALMER.	J. J. WILLSON.
RICHARD REYNOLDS, F.I.C.	RICHARD WILSON.

Secretary	W. F. HUSBAND, LL.B.
Curator	HENRY CROWTHER, F.R.M.S.

LIST OF MEMBERS AND SUBSCRIBERS,

1898-9.

** Members deceased, whose shares have not been transferred.*

PROPRIETARY MEMBERS,

EXEMPT FROM ANNUAL SUBSCRIPTIONS.

2	*Aldam, Wm.	.	
3	Armitage, Robert	.	Farnley.
4	Arthington, Robert	.	Falmouth.
54	Bailey, Benson	.	14, Kelso Road.
49	Baines, Mrs. Arthur	.	The Heath, Adel.
5	*Baines, Herbert S.	.	
63	Barr, Frederick Horatio	.	North Grange Road, Headingley.
6	Barran, Sir John, Bart.	.	Chapel-Allerton Hall.
20	Battye, John	.	Birstal.
22, 24	*Beckett, W., M.P. (2 shares)		
18	Bilbrough, Alfred	.	15, Beech Grove Terrace.
8	Binks, Benj., Junr.	.	5, Park Place.
45	Braithwaite, James, M.D.	.	Clarendon Road.
9	Broadhead, Wm. Henry	.	Broomfield Crescent, Headingley.
11	*Brown, James	.	
31, 62	Brown, Wm. J. (2 shares).	.	Burghwallis Hall, Doncaster.
13, 14	*Calverley, Edmd. (2 shares)		
15	Charlesworth, C. H.	.	6, Queensborough Terrace, Hyde- Park, London, W.
16	Chorley, Mrs.	.	9, Cavendish Road.
19	Close, James William	.	Greek Street.
21	Cudworth, John W.	.	43, Mount Preston.
23	Dibb, Mrs. Elizabeth	.	
25	Eddison, John Edwin, M.D.	.	6, Park Square.
26	*Ellershaw, John	.	
28	Empson, Christopher	.	Mill Mount, York.

- 17 Padgett, Frederick A. . 13, Cookridge Street.

WITH AN ANNUAL SUBSCRIPTION OF ONE GUINEA.

- | | | |
|------|------------------------------|---|
| 32 | Atkinson, Edward, F.L.S. | Langholme, Franklin Road,
Harrogate. |
| 113 | Bailes, Richard | Ridge Villa, Meanwood Road. |
| 116 | *Baines, Frederick | . |
| 2 | *Balme, E. B. Wheatley, M.A. | . |
| 91 | Bedford, James | Woodhouse Cliff. |
| 15 | Bilbrough, Wm. Radford | 15, Beech Grove Terrace. |
| 3 | Birchall, Edward | Inglesmoor House, Moorland Rd. |
| 121 | Blackburn, Henry G. | 2, East Parade. |
| 13 | Boothman, David | Rough House, Headingley. |
| 4 | Boothroyd, William | Grove Mill, Headingley. |
| 89 | Boston, Richard | Boar Lane. |
| 10 | Bowling, John | Newstead House, Spencer Place. |
| 49 | Braithwaite, William | Throstle Nest, Horsforth. |
| 5, 6 | Brown, G. W. (2 shares) | 78, Belsize Park Gardens,
Hampstead, London. |

- 37 Bulmer, Miss . Blenheim Lodge.
 1 Burrell, Benjamin A., F.I.C. 5, Mount Preston.
 86 *Carter, J. B. .
 9 *Chadwick, William .
 77 Clark, Edwin Kitson, M.A. 9, Hyde Terrace.
 14 Conyers, W. H. . The Hills, Ilkley.
 45 Craven, John . 9, Carlton Grove, Blackman Lane.
 104 Crawford, John William . Newton Lane.
 26 Dawson, Oswald . Albion Walk Chambers, Leeds.
 19 Fairbairn, Sir Andrew . Askham Grange, near York.
 118 Flitch, John R. . Moortown.
 52 Fraser, Mrs. James B. . Claremont, Horsforth.
 87 Gibson, Rev. E. C. S., D.D. Leeds Vicarage.
 102-3 } Gott, William Henry (P)
 106-10 } (9 shares)
 114-15 } .
 22 Hargrave, Charles .
 23 *Hargrave, James .
 7 Hargrove, Rev. C., M.A. . 10, De Grey Terrace.
 16 Harvey, William . The Grove, Roundhay.
 81 Hatch, S. C. .
 44 Hepper, Mrs. J. H. . Quebec House, Harrogate.
 51 Hoggard, Alfred . 25, Cavendish Road.
 98 Howgate, William . 21, Blenheim Terrace.
 36 *Hudson, Henry .
 84 Hummel, Prof. J. J. . 152, Woodsley Road.
 120 Ingham, Samuel . Headingley Hall.
 56 James, Christopher William South View, Potternewton Lane.
 96 Jepson, Edward George . 20, Springfield Mount.
 39 Jowitt, Robert Benson . Harehills, Leeds.
 40 Joy, William Lomas . Brentwood, Beverley.
 43 *Kitson, James .
 46 Kitson, J. Hawthorn . Elmete Hall, Roundhay.
 47 Kitson, Sir Jas., Bart., M.P. Gledhow Hall.
 48 Kitson, Mrs. F. W. . Burley Hill, Leeds.

- 90 Lawson, Frederick W. . Oaklands, Adel.
- 50 Leather, Ernest Arthur . Woodland View, Boston Spa,
R.S.O.
- 53 Lupton, Mrs. Arthur . Headingley.
- 95 Lupton, Arthur Greenhow . Wellington Street.
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- 99 Lupton, Hugh . Mount Pleasant, Leeds.
- 54 *Lupton, Joseph .
- 55 Lupton, Mrs. John . Moorlands, Headingley.
- 21 Lupton, Oliver . Shireoak Road, Headingley.
- 63, } Lupton, Fras. Martineau,
100 } M.A. (P) (2 shares) . Rockland, Newton Park.
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- 94 Malcolm, John Cooper . Brighton Villa, New Leeds.
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- 66 Nicholson, A. H. .
- 30 Nicholson, Marshall . Middleton Hall, near Leeds.
- 64 *Nickols, Richard .
- 67 Nunneley, A. G. . Wanstead House, Burley, Leeds.
- 68 Oxley, James Walker . 28, Commercial Street.
- 93 Palmer, Henry John . 55, Albion Street.
- 28 *Passavant, P. W. .
- 82 Pearson, John Thomas . The Hall, Melmerby, S.O.
- 11 Price, Mrs. William N. . Hillary Place.
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- 69 Reynolds, Richard, F.I.C. . Cliff Lodge, Hyde Park.
- 72 Rider, James . 8, Beech Grove Terrace.
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- 105 Ryder, Charles . Gledhow Hill.

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78	*Tetley, F. W.	.
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Green, Miss Ethel	. 1, Tanfield Place.
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don.

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THE
SEVENTY-NINTH REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1898-9.

READ AT THE ANNUAL MEETING, MAY 3rd, 1899.

LEEDS :
JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS, ALBION STREET.

1899.

THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY consists of the following Classes of Members and Subscribers:—

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- (2.) NEW PROPRIETARY MEMBERS (holding £50 Shares), who are entitled to similar personal privileges, and to two transferable tickets. Subscription, £1 1s. per annum.
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- (5.) HONORARY MEMBERS, elected on the recommendation of the Council.
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In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members, voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE END OF THE

SEVENTY-NINTH SESSION.

The Council are pleased to report that the use of the Museum appears to be growing among students, and that in other respects the Society maintains its position among the literary and scientific agencies of the City. They regret, however, to notice that the slight increase in the number of Members and Subscribers which occurred in the previous year has been lost during the past twelve months, and that the roll of the Society now contains 28 names less than last year. They are comprised in the following classes :—

	1898.	1899.
Original Proprietary Members	58	60
New Proprietary Members	82	79
Ordinary Members	2	2
New Ordinary Members	61	61
Annual Subscribers of £1 1s.	124	110
Annual Subscribers of 7s. 6d.	114	101
	<u>441</u>	<u>413</u>

The thanks of the Society are due to the President, Professor Rücker, Mr. Milnes Gaskell, and Dr. Moorman for valuable lectures delivered gratuitously during the past Session.

The full Lecture list was as follows:—

- 1.—“An Ancient House of Healing.” By THE PRESIDENT. *Oct. 18th, 1898.*
- 2.—“The Historical Origin of Sir John Falstaff.” By REV. CANON AINGER, D.D. *Nov. 1st, 1898.*
- 3.—“Musical Concord and Discord.” By Professor A. W. RÜCKER, D.Sc., Sec.R.S. *Nov. 15th, 1898.*
- 4.—“A Study of Splashes, by means of Instantaneous Photography.” By Professor A. M. WORTHINGTON, M.A., F.R.S. *Dec. 6th, 1898.*
- 5.—“Old Musical Instruments,” with Performances on a collection of Old Instruments. By ARNOLD DOLMETSCH. *Dec. 20th, 1898.*
- 6.—“Instinct and Intelligence in Animals.” By Professor C. LLOYD MORGAN. *Jan. 10th, 1899.*
- 7.—“Municipal Government Seventy Years ago.” By C. G. MILNES GASKELL, M.A. *Jan. 17th, 1899.*
- 8.—“The Progress of Geography; (a) The Great Globe, (b) The Outlook Tower.” By Professor PATRICK GEDDES, F.R.S.E. *Feb. 7th, 1899.*
- 9.—“Lord Chesterfield.” By Professor W. A. RALEIGH, M.A. *Feb. 21st, 1899.*
- 10.—“Sea-water Animals of Celebes.” By Professor SYDNEY J. HICKSON, D.Sc., F.R.S. *March 7th, 1899.*
- 11.—“Ethical Problems of Shakspeare’s ‘Tragedies.’” By F. W. MOORMAN, Ph.D. *March 21st, 1899.*
- 12.—“Christmas Island; its Structure and Natural History.” By CHARLES W. ANDREWS, F.G.S. *April 11th, 1899.*

Although some of these lectures were of unusual interest, the attendance was, on the average, below that of recent years.

Attention has been given during the year to the ventilation of the Lecture Hall, and some important improvements, which have not yet been completed, have been taken in hand.

The lighting by electricity has also been improved, though it is feared that the annual cost will prove to be much beyond what was contemplated when consent was given to the alterations proposed by the City Corporation, which supplies the current.

It is gratifying to note from the financial statement that, in addition to providing for the current expenses, the income sufficed to pay off most of the debt of £43 owing to the Bank at the beginning of the year. The balance due to the Bank is now £3.

Increasing reference is being made to the Museum Collections by undergraduates of the Victoria University, by specialists in lepidoptera and mollusca, and by school teachers and students preparing for science examinations. Several visits have been made by children from schools outside the City, under the guidance of their masters, and there has been a marked appreciation of the Museum by the teachers of the Leeds Board Schools.

The additions by gifts to the Museum during the past year include a small series of uncommon fossil coal plants from the Barnsley Coal Measures, by Mr. William Hemingway, of Barnsley, and another of more familiar forms, but in a beautiful state of preservation, collected from the Brown Metal Seams of the Coal Measures, exposed in the making of the Gildersome Tunnel by the donor, Mr. William Hiscoe, of Gelderd Road, Leeds.

A collection of fossils from the Carboniferous Limestone of Craven has been acquired by purchase.

Three varieties of the Golden Pheasant, presented by Mr. J. W. Marsden, Avenue House, Leeds, Mr. John Waite, Headingley, and Mr. J. T. Pollard, Chapeltown, have been grouped in the Bird Room, to illustrate some of the marked contrasts in plumage colours which these birds may assume. One example is that of a female bird which has partially acquired the characteristic plumage of a male bird.

The Egyptian objects in the Museum have been re-arranged in cases in the Inner Vestibule, and so displayed that even the smallest of them may be fully examined. The Council have had these cases specially fitted with the electric light so that the increasing class of visitors who are interested in Egyptian antiquities may have greater facilities for studying them.

A small collection of Peruvian pottery has been deposited on loan, in the Museum, by Mr. C. W. Hodgson, of Johannesburg. Like the collection which the Society already possesses, in black ware, the objects are moulded in the form of grotesque figures of men, birds, &c., but the body of the ware is yellow, coloured and ornamented with a red pigment.

The past year has also seen the initiation of a new arrangement of the plants of the Coal Period, of which the Society possesses a good local collection. The specimens have been named, and it is proposed during the coming year to group the various forms under the classes to which they belong, so that students of Palæobotany may find them helpful in their determination of the fossil plants of the district.

Great interest has been taken by visitors in those cases in the Museum which are specially set apart for the display of injurious insects, attack and defence among animals, and the morphology and eggs of birds.

The thanks of the Society are due to the Trustees of the British Museum, of the Smithsonian Institute, and other learned Societies, for their continued generous donations to the library. Lord Armstrong, C.B., F.R.S., has kindly presented copies of his work on "Electric Movement in Air and Water," and the "Supplement" to the same work. There has been a marked increase of the use of the library for reference purposes, and more books than usual have been borrowed.

The past year has also seen the housing of the Leeds Photographic Society in the building. Accommodation has been provided for their books, pictures, and apparatus, and the Council is pleased to learn that the change has been advantageous to them.

Through the kindness of Mr. Reginald Wigram, Oakfield, Kirkstall, who lent his collection of relics from the battlefield of Omdurman, visitors to the Museum had an opportunity during the month of March of seeing displayed in the rooms the many curious objects Mr. Wigram and his friends have acquired from the Soudan. The collection included swords, many of which were engraved, guns, daggers in unique mountings, spears, shields, articles of dress, and musical instruments.

The number of visitors to the Museum during the year was 24,514.

The Council regret to announce the death of one of the Honorary Members of the Society, the Rev. Thos. Hincks, B.A., F.R.S. Mr. Hincks, who was Minister of Mill Hill Chapel, became a member of the Council of the Leeds Philosophical and Literary Society in 1857, and Curator of Zoology in 1858, which office he held for ten years, resigning it on account of failing health. He was Vice-President in 1861 and 1862, and President in the three succeeding years. He rendered useful service to the Society, not only in the tenure of these several offices, but also by the delivery of lectures on his special branch of science. On his retirement in 1869 he was elected an Honorary Member of the Society. Mr. Hincks took rank among the best Zoologists of his generation. His two great works, "The British Hydroid Zoophytes," and "The British Marine Polyzoa," are of first-rate reputation, being known and quoted throughout the world. His accuracy in description was universally recognised, and he spared no pains to make himself intimately acquainted with fresh, and, if possible, living examples of the animals which he described. Mr. Hincks will be long remembered with honour by students of Natural History.

*Summary of Meteorological Observations taken at the Philosophical Hall,
and at Woodhouse Cliff, Leeds, during the year 1898.*

1898.	Mean Height of Barometer (inches).	Mean Temperature of Air (degrees).	Mean Temperature of Earth (degrees).	Amount of Rainfall.	
				Museum (inches).	Woodhouse Cliff (inches).
January	29'998	45'2	41'9	'66	'85
February	29'620	41'1	40'8	1'39	1'61
March	29'660	40'4	39'4	'78	'79
April	29'621	47'5	43'1	2'62	2'57
May	29'590	49'4	47'1	1'81	1'61
June... ..	29'724	56'7	52'5	2'43	1'50
July	29'849	60'4	56'2	'84	'81
August	29'740	62'3	56'9	3'23	3'25
September	29'835	59'9	55'7	'31	'39
October	29'591	53'0	51'4	3'50	3'62
November	29'578	45'6	47'6	1'76	2'22
December	29'641	45'4	43'2	2'13	2'43
Yearly Means ...	29'703	50'5	48'0	21'46	21'55

EXTREMES FOR THE YEAR.

Greatest Barometric pressure—30'45 inches on January 15th, the Temperature of the Mercury being 50° F.; Least pressure—28'72 on November 25th, the Temperature of the Mercury being 47°.

Greatest degree of Heat, indicated by the Thermometer in the shade—85° on September 17th; minimum—25° on November 23rd.

Lowest Earth Temperature was 37'8° on March 9th, 10th, 11th, and 12th; the Highest 58'4° on August 23rd and 24th.

Greatest fall of Rain (during 24 hours)—1'18 inches on June 26th. Average yearly Rainfall at the Museum for the ten years 1889—1897, 25'42 inches.

RELATIVE SUNSHINE AT THE URBAN AND RURAL STATIONS,
THE MUSEUM AND ADEL.

Deficiency of Museum from Adel:—

1887-88	24'0 per cent.	1893-94	20'0 per cent.
1889-90	33'4 „	1895-96	19'3 „
1891-92	30'5 „	1897-98	18'7 „

The Sunshine of 1897, taken by itself, showed a deficiency of only 16'5 per cent.; this is considered attributable to the great Engineering Strike, which led to the closing of many of the workshops of the City for seven months.

The adopted Mean Temperature of the Air is the mean of the following four daily readings:—(a. and b.) Dry Bulb Thermometer read at 10 a.m. and 4 p.m.; (c. and d.) Maximum and Minimum Thermometers, in a screen.

The Readings of the Earth Thermometer are taken by a Symons' instrument, exposed at a depth of 2 feet 6 inches below the ground at Woodhouse Cliff, and read at 10 a.m. The monthly returns are the means of the daily readings.

The Hall is situated at 1° 32' 45" W., and 53° 47' 51" N.

The Bench Mark at the corner of the Philosophical Hall is 131'8 feet above sea level, and 10 inches above the pavement. The Cistern of the Barometer is 12'8 feet, the Thermometers are 42 feet, and the Rain-gauge is 45 feet above the Bench Mark.

SUNSHINE AT LEEDS IN 1898.

The observations recorded below were made by Jordan's Photographic Sunshine Recorder at the following stations in Leeds:—

1. The Museum of the Philosophical and Literary Society, situate in the centre of the city; elevation above the sea, 145 feet.
2. Woodhouse Cliff, $\frac{1}{2}$ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the city.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible Duration.
JANUARY	1	11'40	4'84
	2	13'20	5'35
	3	10'50	4'49
FEBRUARY	1	62'30	23'40
	2	74'15	27'80
	3	91'00	34'00
MARCH	1	83'25	22'91
	2	110'55	30'47
	3	120'40	33'14
APRIL	1	95'45	22'90
	2	107'45	25'77
	3	117'45	28'17
MAY	1	115'40	23'50
	2	132'05	26'84
	3	140'00	28'55
JUNE	1	150'50	29'80
	2	170'40	33'72
	3	170'55	33'77
JULY	1	202'35	40'03
	2	221'10	43'70
	3	232'45	46'00
AUGUST	1	148'35	32'65
	2	161'40	35'53
	3	168'30	37'03
SEPTEMBER	1	115'20	30'83
	2	118'05	31'57
	3	132'55	35'53
OCTOBER	1	59'35	18'62
	2	69'20	21'66
	3	81'05	25'33
NOVEMBER	1	23'00	9'23
	2	37'00	14'85
	3	39'40	15'93
DECEMBER	1	17'55	8'07
	2	31'45	14'30
	3	43'00	19'30

SUMMARY FOR THE YEAR.

	Hours recorded.		Difference from mean of ten years in hours.		Percentage of possible duration.	
	H.	M.	H.	M.		
Museum ..	1,086	50	..	+22 02	..	24'62
Woodhouse Cliff ..	1,243	00	..	-14 42	..	28'72
Lawnswood ..	1,349	05	..	-45 37	..	30'56
27'8 per cent. mean for 1898.					31'6 per cent. mean for 1893.	
31'4 ..	1897.			27'5 ..	..	1892.
26'5 ..	1896.			22'2 ..	..	1891.
37'5 ..	1895.			24'4 ..	..	1890.
29'0 ..	1894.			20'7 ..	..	1889.
or 27'8 per cent. mean for ten years.						

The Meteorological Office publishes the following records of sunshine for 1898, as observed at stations taken as representing specified districts:—

Stations.	Number of Hours.	Difference from mean.	Percentage of possible duration.
Scotland, N. (Stornoway, &c.)	1,230	+169	28
" E. (Aberdeen, Marchmont)	1,314	+39	30
" W. (Glasgow; Douglas, Isle of Man) ..	1,320	+	30
England, N.E. (Durham, York)	1,237	-18	29
" N.W. (Stonyhurst, Blackpool, Llandudno)	1,432	+113	33
" Mid. (Cirencester, Oxford, &c.)	1,387	+36	32
" S. (London, Hastings, Southampton, &c.)	1,535	-17	36
" E. (Hillingdon, Goldstone, Cambridge)	1,556	-12	35
" S.W. (Pembroke, Falmouth, Plymouth, &c.)	1,698	+49	39
Ireland, N. (Armagh, Markree Castle) ..	1,296	+29	29
" S. (Dublin, Parsonstown, Valencia) ..	1,486	+43	34
Channel Islands (Jersey)	1,968	+129	46

SUMMARY.

33'5 per cent. mean for United Kingdom, 1898.	37'0 per cent. mean for United Kingdom, 1893.
34'1 ..	35'2 ..
31'8 ..	32'6 ..
35'8 ..	30'7 ..
31'1 ..	29'2 ..
or 33'10 per cent. mean for ten years.	

LIST OF PRESIDENTS

SINCE

THE FOUNDATION OF THE SOCIETY.

1821—5.	JOHN MARSHALL.
1826 & 7.	Rev. W. H. BATHURST, M.A.
1828—30.	MICHAEL THOS. SADLER, M.P.
1831 & 2.	WILLIAM HEY.
1833 & 4.	JAMES WILLIAMSON, M.D.
1835 & 6.	Rev. JOSEPH HOLMES, M.A.
1837—9.	Rev. RICHARD WINTER HAMILTON.
1840 & 1.	ADAM HUNTER, M.D.
1842—4.	JOHN HOPE SHAW.
1845—50.	Rev. WILLIAM SINCLAIR, M.A.
1851.	WILLIAM WEST, F.R.S.
1852 & 3.	Rev. CHARLES WICKSTEED, B.D.
1854—6.	JOHN HOPE SHAW.
1857.	JAMES GARTH MARSHALL, F.G.S.
1858.	Rev. W. F. HOOK, D.D.
1859 & 60.	Rev. ALFRED BARRY, M.A.
1861 & 2.	THOS. PRIDGIN TEALE, F.R.S.
1863—5.	Rev. THOS. HINCKS, B.A.
1866 & 7.	CHARLES CHADWICK, M.D.
1868—71.	JOHN DEAKIN HEATON, M.D.
1872 & 3.	Rev. CANON WOODFORD, D.D.
1874 & 5.	J. I. IKIN, F.R.C.S.
1876 & 7.	Rev. J. H. MCCHEANE, M.A.
1878—80.	T. CLIFFORD ALLBUTT, M.D., F.L.S.
1881 & 2.	Rev. JOHN GOTT, D.D.
1883 & 4.	J. E. EDDISON, M.D.
1885.	EDWARD ATKINSON, F.L.S.
1886—8.	THOMAS MARSHALL, M.A.
1889—91.	THOS. PRIDGIN TEALE, M.A., F.R.S.
1892 & 3.	Rev. J. H. D. MATTHEWS, M.A.
1894 & 5.	Rev. CHARLES HARGROVE, M.A.
1896 & 7.	EDMUND WILSON.
1898 & 9.	NATHAN BODINGTON, M.A., Litt.D.

LIST OF DONATIONS AND ADDITIONS

TO THE
SOCIETY'S MUSEUM AND LIBRARY.

1898-9.

ZOOLOGY.

- | | | |
|--|---|-----------------------------|
| Nightjar (<i>Caprimulgus europæus</i>) | { | Mr. F. Wright, Albion |
| | | Walk, Leeds. |
| Lady Amherst Pheasant (<i>Chrysolophus</i>
<i>amherstiae</i>) | { | Mr. J. W. Marsden, Avenue |
| Purple Gallinule (<i>Porphyrio cæruleus</i>) | | House, Leeds. |
| Lady Amherst Pheasant (<i>Chrysolophus</i>
<i>amherstiae</i>) female assuming male
plumage | { | Mr. John Waite, Headingley. |
| | | |
| Snakes in Spirit | { | Mr. Smith Holmes, 11, |
| | | Cowper St., Chapeltown. |
| Skin of Secretary Vulture (<i>Serpentarius</i>
<i>secretarius</i>) from S. Africa | { | Mrs. Campbell, Bennett |
| | | Road, Headingley. |

GEOLOGY.

- | | | |
|--|---|--------------------|
| A series of Coal Measure Fossils,
including <i>Cordaites principalis</i> ;
<i>Bothrodendron minutifolium</i> ; <i>Diplo-</i>
<i>thmenima Jacquotii</i> ; <i>Renaultia Foot-</i>
<i>neri</i> ; <i>Artisia transversa</i> , from the
Barnsley District..... | { | Mr. Wm. Hemingway, |
| | | Barnsley. |

- A small series of Coal Measure Fossils
from the Brown Metal Beds, exposed
in making the Gildersome Tunnel,
Beeston Royds, including *Sphenop-*
teris, *Alethopteris louchitica*, *Calamo-*
stachys, *Stigmaria*, &c. } Mr. Wm. Hiscoe, Gelderd
Road, Leeds.
- Small collection of Mountain Lime-
stone Fossils..... } Purchased.
- Specimens of *Axinus obscurus*, from
the Magnesium Limestone, Mickle-
field } Mr. Dixon Wilby, East
View, Crossgates.

ARCHÆOLOGY.

- Mosaic tiles from Rome and Baia; }
Tiles from the Abbeys of Rievaulx } Mr. Alfred Birtwhistle, Otley
and Fountains } Road, Skipton.

PUBLICATIONS.

- Catalogue of Welwitsch's African
Plants, Parts II. & III. }
List of the Types and Figured }
Specimens of Fossil Cephalopoda... }
Catalogue of the Lepidoptera Pha- } The Trustees of the British
lænæ } Museum.
Catalogue of the Syntomidæ, text ... }
Catalogue of the Syntomidæ, coloured }
plates }
Catalogue of the Birds, Vol. XXVI.... }
- Electric Movement in Air and Water, }
with Theoretical Inferences } The Author, Lord Arm-
Electric Movement in Air and Water, } strong, C.B., F.R.S.
Supplement }
- Maps and Plans of Jerusalem } Mr. Edwd. Atkinson, F.L.S.
- Session Booke of Bonckle, from 1684 }
to 1694 } The Berwickshire Natural-
ists' Club.
- On the Water Supplies of Yorkshire }
(pamphlet) } The Author, Mr. Thos.
Fairley, F.R.S.E.
- Science of Man and Australasian }
Anthropological Journal } The Publishers, Sydney.

PERIODICALS.

WEEKLY.

Nature Purchased.

MONTHLY.

Annals and Magazine of Natural
History } Purchased.
Geological Magazine Purchased.
Journal of the Chemical Society Purchased.
Monthly Notices of the Royal Astro-
nomical Society } The Society.
Philosophical Magazine and Journal
of Science } Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical
Society } The Society.

QUARTERLY.

Quarterly Journal of Microscopical
Science } Purchased.
Quarterly Journal of Geological Society The Society.
Quarterly Returns of Marriages,
Births, and Deaths } Registrar-General.
Journal of the Anthropological
Institute } The Institute.
Zeitschrift für Wissenschaftliche Zoo-
logie } Purchased.
Journal of the Linnean Society { Mr. Edward Atkinson,
F.L.S.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions Purchased.
Proceedings of the Royal Society ... The Society.
Proceedings of the Royal Institution
of Great Britain } The Institution.
Publications of the Ray Society Purchased.

Abridgments of Specifications for Patents, Period 1884—88 ; 1889—92	The Comptroller - General of Patents.
British Association Report.....	The Association.
Greenwich Observations.....	The Astronomer-Royal.
Memoirs of the Royal Astronomical Society	The Society.
Radcliffe Astronomical and Meteorological Observations	Radcliffe Trustees.
Symons's British Rainfall, 1897	Purchased.
Monograph of the Palæontographical Society	Purchased.
Proceedings of the Yorkshire Geological and Polytechnic Society.....	The Society.
Transactions of the Leeds Geological Association	The Association.
Proceedings of the Liverpool Geological Society.....	The Society.
Journal of the Liverpool Geological Association	The Association.
Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne.....	The Tyneside Naturalists' Field Club.
Proceedings of the Birmingham Philosophical Society	The Society.
Annual Report of the Yorkshire Philosophical Society	The Society.
Transactions of the Leicester Literary and Philosophical Society	The Society.
Report of the Committee of Leicester Town Museum	The Museum.
Report of the Royal Institution, Hull	The Institution.
Report of the Meteorological Department of the Borough of Southport.	The Meteorological Observer.
Report of the Bristol Museum	The Museum Committee.
Report of the Reading Museum	The Free Library and Museum Committee.
Annual Report of the Brighton Town Museum	The Museum.
Annual Report, Middlesex Hospital...	The Hospital.

Annual Report of the Birkenhead Literary and Scientific Society	}	The Society.
Proceedings of the Liverpool Literary and Philosophical Society	}	The Society.
Annual Report and Proceedings of the Liverpool Science Students' Association	}	The Association.
Memoirs and Proceedings of the Man- chester Literary and Philosophical Society	}	The Society.
Transactions of the Manchester Geo- logical Society	}	The Society.
Reports of the Manchester Museum Handbooks do. do.	}	The Keeper.
Annual Report of the Sheffield Literary and Philosophical Society }		The Society.
Annual Report of the Chester Society of Natural Science and Literature }		The Society.
Transactions of the Leeds Naturalists' Club and Scientific Association..... }		The Association.
Journal of the Royal Institution of Cornwall	}	The Institution.
Annual Report of the Royal Cornwall Polytechnic Society..... }		The Society.
Report of Associated Architectural Societies	}	The Association.
Journal of the Chester Archæological and Historic Society	}	The Society.
Geological Record		Purchased.
Transactions of the Yorkshire Natural- ists' Union	}	The Union.
Proceedings of the Royal Society of Edinburgh	}	The Society.
Transactions do. do.	}	
Transactions of the Edinburgh Geo- logical Society..... }		The Society.
Proceedings of the Glasgow Philoso- phical Society	}	The Society.
Proceedings of the Berwickshire Naturalists' Club	}	The Club.

Scientific Proceedings of the Royal Dublin Society.....	}	The Society.
Scientific Transactions do.		
Transactions of the Royal Irish Academy	}	The Academy.
Proceedings do. do.		
Journal of the Royal Geological Society of Ireland	}	The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club }	}	The Club.
Publications of the Royal Swedish Academy of Sciences.....	}	The Academy.
Papers of the Royal University of Norway	}	The University.
Bulletin of the Geological Institution of the University of Upsala	}	The Institution.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhand- linger.....	}	Royal Danish Society of Sciences.
Bulletin, Société Impériale, Moscow...	}	The Society.
"Leopoldina" Amtliches organ der Kaiserlichen, Leopoldino-Carolini- schen Deutschen Akademie der Naturforscher	}	The Academy.
Mittheilungen der Kais. Königl. Geo- graphischen Gesellschaft in Wien ... }	}	The Society.
Memoirs of the National Academy of Sciences	}	The Academy.
Report of Australasian Association for the Advancement of Science.....	}	The Association.
Journal and Proceedings of the Royal Society of New South Wales	}	The Society.
Journal of the Royal Geographical Society of Australasia	}	The Society.
Wealth and Progress of New South Wales	}	The Agent-General.
Records of the Geological Survey of New South Wales	}	The Surveyor.
Memoirs of the Geological Survey of New South Wales		

Annual Report and Papers of the Department of Mines and Agriculture, New South Wales	} The Department.
Prodromus of the Zoology of Victoria	} The Editor.
Records of the Australian Museum	} The Trustees.
Report of the Trustees of the Australian Museum.....	
Proceedings of the Royal Society of Queensland	} The Society.
Queensland Agricultural Journal	} The Society.
Annals of the Queensland Museum...	} The Trustees.
Transactions and Proceedings of the New Zealand Institute	} The Institute.
Papers and Proceedings of the Royal Society of Tasmania	} The Society.
Proceedings and Transactions of the Royal Society of Canada	} The Society.
Proceedings of the Canadian Institute	} The Institute.
Annual Report do.	
Transactions do.	
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	} The Institute.
Annual Report, Hamilton Public Library, Ontario, Canada	} The Librarian.
Journal and Proceedings of the Hamilton Association	} The Association.
Geological and Natural History Survey of Canada	} Department of the Interior
Annual Report and Papers—do.	
Contributions to Canadian Palæontology	
Bulletin of the Natural History Society of New Brunswick.....	} The Society.
Memorias de la Sociedad Científica (Mexico)	} The Society.
“ Boletin Mensual ” Observatorio Meteorologico-Magnetico Central de Mexico	} The Editor.
Anuario del Observations Astrón- omico Nacional, Mexico.....	} The Astronomer.

Boletin del Observatorio Astronómico Nacional de Tacubaya	}	The Observer.
Report of the Museum National, Rio-de-Janeiro.....		
Archivos do.	}	Directeur-Général.
Cape Meridian Observations		
Report of H.M. Astronomer at the Cape of Good Hope to the Secretary of Admiralty	}	Cape Astronomer-Royal.
Transactions of the American Philosophical Society		
Proceedings do.	}	The Society.
United States Geological Survey Annual Report.....		
Contributions to American Ethnology.	}	The Department.
United States Geographical and Geological Survey		
United States Department of Agriculture, Publications of	}	
Natural History of the Tres Marias Islands, Mexico		
Composition of Maize	}	
Cuckoos and Shrikes		
Geographic Distribution of Cereals of North America	}	The Department.
Life Zones and Crop Zones of the United States		
North American Bats of the Family Vespertilionidæ	}	
Report of the Smithsonian Institution Smithsonian Miscellaneous Collections Smithsonian Contributions		
Annual Reports of the Bureau of Ethnology	}	The Institution.
Miscellaneous Publications of the Bureau of Ethnology		
Proceedings of United States National Museum	}	
Report do. do.		
Bulletins do. do.	}	The Museum.
Transactions of the Academy of Science of St. Louis		

Proceedings of the Academy of Natural Sciences of Philadelphia ...	}	The Academy.
Papers do. do.		
Proceedings of the American Academy of Arts and Sciences.....	}	The Academy.
Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	}	The Academy.
Memoirs of the National Academy of Sciences, Washington.....	}	The Academy.
Proceedings of the Davenport Acad- emy of Natural Science.....	}	The Academy.
Transactions of the Wagner Free Institute of Science, Philadelphia ...	}	The Institute.
Annual Report, Transactions, and Mis- cellaneous Papers of the Historical and Scientific Society of Manitoba	}	The Society.
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Hannam, Mrs. W. S.	.	4, East Parade.
Hebblethwaite, Mrs.	.	5, Grosvenor Road, Headingley.
Hellier, Mrs.	.	1, De Grey Terrace.
Hepper, Mrs.	.	Clareville, Headingley.
Hewetson, Mrs. H. B.	.	9, Hanover Square.
Hirsch, Mrs. Paul	.	Alma House, Headingley.
Hirsch, Miss	.	Do.
Hirsch, Miss Theresa	.	Do.
Holbrook, Mrs.	.	St. Ann's Villas, Monkbridge Rd.
Josephy, Mrs. B.	.	25, Hyde Terrace.
Josephy, Miss B.	.	Do.
Josephy, Mrs. H.	.	5, Beech Grove Terrace.
Josephy, Miss	.	Do.
Josephy, Hermann	.	Do.

Kitson, Mrs. F. J.	. Oatlands, Burley, Leeds.
Lean, Miss	. 7, Woodsley Terrace.
Lupton, Mrs. Arnold	. 6, De Grey Road.
Mathers, Miss	. Hanover House.
Millard, Mrs.	. 52, Cardigan Road.
Nelson, Miss C. E.	. St. John's Cottage, St. John's Rd.
Nelson, Miss Louisa	. Do. do.
Newill, Miss	. 9, Kelso Road.
Nicholson, Miss	. Moorfield House, Headingley.
Nicholson, Wilfred E.	. Do. do.
Nixon, Mrs. S. E.	. St. Chad's Hill, Far Headingley.
Nussey, Miss	. Potternewton Hall.
Nussey, Miss M.	. Springville, Shaw Lane.
Pepper, Mrs. J. E.	. 42, Hyde Terrace.
Phillips, Miss Dorothy	. Hazel House, Methley.
Phillips, Miss Janet	. Do.
Ramsbotham, Miss E. J.	. 16, Park Place.
Redmayne, Mrs. John	. Grove House, Headingley.
Richardson, Mrs.	. Cliff Road.
Ryder, Miss E. I.	. Gledhow Hill.
Ryder, Miss Louisa	. Do.
Saville, Miss S. E.	. 12, Granby Road, Headingley.
Scattergood, Miss	. 41, Park Square.
Somers, Mrs.	. 48, Woodhouse Lane.
Stables, Mrs. Marshall	. Hope Villa, Armley.
Stables, Miss	. Horsforth.
Stables, Miss Lucy	. Do.
Stockdale, Miss Enid	. Spring Lea, Springfield Mount.
Stockdale, Miss M. B.	. Do. do.
Stroud, Mrs. W.	. Rupert Lodge, Grove Road.
Talbot, Mrs. G.	. Southfield, Burley.
Talbot, Miss	. Do.
Taylor, Mrs. G. S.	. Beeston Hill.
Taylor, Miss	. Do.
Taylor, Miss	. Buckingham House, Headingley.

Taylor, T. L.	. Buckingham House, Headingley.
Teale, Miss	. North Grange, Headingley.
Tetley, Mrs. C. F.	. Cardigan Road, Headingley.
Tiffany, Mrs. Frank	. 3, Kelso Road.
Tiffany, J. E.	. Do.
Wager, Mrs.	. Bank Villa, Chapel-Allerton.
Walker, Mrs. A. T.	. The Elms, Weetwood.
Walker, Miss E. H.	. Newton Park.
Walker, Miss M. H.	. Do.
Walker, Miss M. I.	. Do.
Ward, Mrs. G.	. Buckingham Terrace.
Warren, Miss	. Flower Bank, Burley.
Williamson, Mrs. H. L.	. 4, St. Chad's Gardens, Far Headingley.
Willson, Miss Emilie Dorothy	. Ballamona, Headingley.
Willson, Miss Margaret	. Do.
Wood, Miss	. St. Mark's Terr., Woodhouse Lane.

Members and Subscribers are requested to inform the Secretary of any errors that may be found in the above list.

HONORARY MEMBERS.

- | | |
|---|--|
| Professor T. Clifford Allbutt,
M.D., F.R.S., Cambridge. | Francis Galton, F.R.S., 42, Rutland Gate, Knightsbridge, London, S.W. |
| The Right Rev. Bishop Barry,
D.D., Canon of Windsor, Windsor. | W. H. Gellibrand, Cleveland, Ouse, Tasmania. |
| Prof. Graham Bell, The National Telephone Company, Milk St., Boston, Mass., U.S.A. | Cyril Graham, B.A., 9, Cleveland Row, St. James's, London, S.W. |
| Sir Frederick J. Bramwell, Bart.,
F.R.S., M.Inst.C.E., 5, Great George Street, Westminster. | Wm. Hancock, F.L.S., F.R.G.S. |
| Duca Frederico Lancia di Brolo. | Wm. Hartley, Durban, Port Natal. |
| Principal Sir J. W. Dawson,
C.M.G., LL.D., F.R.S., Vice-Chancellor of McGill University, Montreal. | Capt. James Holt, A.D.C., Government House, Wellington, New Zealand. |
| Dr. Day, Mendoza, Argentine Republic. | The Right Hon. Lord Londesborough, Londesborough Lodge, Brough; 3, Grosvenor Square, London, W. |
| The Right Hon. Earl Fitzwilliam, K.G., Wentworth House, Rotherham; 19, Grosvenor Square, London, W. | The Right Hon. Sir John Lubbock, Bart., M.P., D.C.L., LL.D., F.R.S., High Elms, Hayes, Kent. |
| Herr Franz Foetterle, Secretary of the Imperial Royal Geographical Society of Vienna. | Sir Clements R. Markham, K.C.B., F.R.S., F.L.S., Pres. R.G.S., 21, Eccleston Square, Pimlico, London, S.W. |

The Chevalier Michelotti.

H. G. Moore, Glenmark, New Zealand.

Sir Charles Nicholson, Bart., D.C.L., &c., The Grange, Totteridge, Hertfordshire.

C. C. Oxley, Minster House, Ripon.

Sir T. Wemyss Reid, LL.D., 26, Bramham Gardens, South Kensington, London.

The Most Hon. the Marquis of Ripon, K.G., F.R.S., F.G.S., Studley Royal, Ripon.

Prof. A. W. Rücker, M.A., F.R.S., 19, Gledhow Gardens, London.

Col. Edmd. Smyth, Theescombe House, Amberley, Stroud.

Prof. T. E. Thorpe, D.Sc., Ph.D., F.R.S., Somerset House, London.

Edward Harry Woods, Rosario, Argentine Republic.

THE
EIGHTIETH REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1899-1900.

READ AT THE ANNUAL MEETING, MAY 1st, 1900.

LEEDS:
JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS, ALBION STREET.

1900.

THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY consists of the following Classes of Members and Subscribers:—

- (1.) ORIGINAL PROPRIETARY MEMBERS (holding £100 Shares), who are entitled to personal admission to the Museum, Library, Lectures, and all other Meetings of the Society, and to two transferable tickets to admit visitors to the Lectures. They are exempt from Annual Subscription.
- (2.) NEW PROPRIETARY MEMBERS (holding £50 Shares), who are entitled to similar personal privileges, and to two transferable tickets. Subscription, £1 is. per annum.
- (3.) ORIGINAL ORDINARY MEMBERS (holding £3 3s. Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £2 2s. per annum.
- (4.) NEW ORDINARY MEMBERS (holding £20 Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £1 is. per annum.

The following are entitled to personal admission to the Museum, Library, and Lectures, but not to business meetings; nor have they any transferable tickets to admit visitors:—

- (5.) HONORARY MEMBERS, elected on the recommendation of the Council.
- (6.) SUBSCRIBERS of £1 is. per annum.
- (7.) SUBSCRIBERS of 7s. 6d. per annum, being Ladies or Young Persons resident with Members, or with Subscribers in Class (6).

A list of shares from time to time offered for sale by Members is kept in the office, and information as to price, &c., may be obtained from the Curator.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members, voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE END OF THE

EIGHTIETH SESSION.

It is gratifying to the Council to record at the end of the Eightieth Session an increase of Subscribers, and an improved attendance at the lectures.

The Members and Subscribers are comprised in the following classes :—

			1899.	1900.
Original Proprietary Members	...	..	60	64
New Proprietary Members	...	...	79	78
Ordinary Members	...	...	2	2
New Ordinary Members	...	...	61	59
Annual Subscribers of 21s.	...	...	110	118
Annual Subscribers of 7s. 6d.	...	...	101	104
			<hr/>	<hr/>
			413	425
			<hr/>	<hr/>

The thanks of the Society are due to Mr. Thomas Marshall, Mr. H. J. Palmer, the Rev. Charles Hargrove, and Mr. William Hancock for valuable lectures delivered gratuitously during the past Session.

The full Lecture list is as follows:—

- 1.—“Egypt, from Abraham to Athanasius.” By W. M. FLINDERS PETRIE, D.C.L., LL.D., Ph.D. *Oct. 17th, 1899.*
- 2.—“The Language of Line.” By WALTER CRANE, A.R.W.S. *Oct. 24th, 1899.*
- 3.—“On some recent contributions to our Knowledge of Heredity.” By KARL PEARSON, M.A., F.R.S. *Nov. 7th, 1899.*
- 4.—“The Electrical Fish of the Nile.” By FRANCIS GOTCH, M.A., F.R.S. *Nov. 21st, 1899.*
- 5.—“Homeric Topography: Troy, Mykenæ, Delphi.” By THOMAS MARSHALL, M.A. *Dec. 5th, 1899.*
- 6.—“Sydney Smith as a Yorkshire Country Parson.” By H. J. PALMER. *Dec. 19th, 1899.*
- 7.—“Balzac ; ses œuvres et son influence.” By H. E. BERTHON, B.A. *Jan. 9th, 1900.*
- 8.—“The History of Gardens.” By A. FORBES SIEVEKING, F.S.A. *Jan. 16th, 1900.*
- 9.—“Wireless Telegraphy.” By OLIVER J. LODGE, D.Sc., LL.D., F.R.S. *Feb. 6th, 1900.*
- 10.—“The City of Rome: its Rise, its Grandeur, and its Ruin.” By the Rev. CHARLES HARGROVE, M.A. *Feb. 20th, 1900.*
- 11.—“Robert Louis Stevenson.” By EDMUND GOSSE, LL.D. *Mar. 6th, 1900.*
- 12.—“Fiction the highest form of Truth.” By I. ZANGWILL, B.A. *Mar. 20th, 1900.*
- 13.—“Travels in Guatemala, Salvador, and Nicaragua.” By WILLIAM HANCOCK, F.L.S., F.R.G.S. *April 3rd, 1900.*

Three Museum Lectures were given by the Curator during the Christmas Holidays, illustrated by lantern slides on “Lanuvium, a Buried Roman City;” “The Clerk of the Weather;” and “Some Marvels of Bird Life.” The interest in these Lectures is maintained, the average attendance was two hundred, and included many members and subscribers of

the Society. Quite a large number of visitors went carefully over the objects in the Savile and Bird Rooms at the close of the first and third lectures.

The Council note with pleasure the sustained interest in the General Collections in the Museum, by students of Natural History. During the past year the objects have been described to teachers from various parts of West Yorkshire, and more visits have been made by Board School children, under the direction of their teachers, than previously noted. The Buckton Collection of Lepidoptera has been largely referred to by visitors to assist in the classification of Butterflies and Moths.

The Council have from time to time had under consideration the method of display of the collection of coins in the possession of the Society, bequeathed principally by Mr. George Baron, of Drewton Manor, in 1854, and supplemented by gifts and purchases. The Collection consists of Greek, Roman, Mediæval, British, Saxon, and English coins, together with interesting medals, but the Council felt that no method of display would be satisfactory unless accompanied by full references or a catalogue, the preparation of which would require continuous research. It was, therefore, with much pleasure that they accepted the kind offer of Mr. Aquila Dodgson, of Headingley, a member of the Society and a numismatist, to arrange and catalogue the Collection. Under Mr. Dodgson's hands, the Collection has in part undergone a revision and re-arrangement in chronological sequence. This is preparatory to the writing of a catalogue, accompanied by explanatory notes of the principal persons and events depicted on the coinage. A commencement has been made with the Roman issue, that section being the largest and most complete, and it is hoped that there will be ready soon a catalogue of the Early Bronze and Silver Coinage, commonly known as the Family or Consular Coins.

The large Zoological Room has been distempered a lighter colour, and the insides of the wall cases repainted a bluish grey for the better reflecting of the light from the glass roof, and to give higher relief to the objects in the cases.

The gifts of Natural History objects include a mounted specimen of the Capercaillie and eggs of the Emu from Mr. Alfred White, F.Z.S., Leeds; a Demoiselle Crane by Mr. J. W. Marsden, Leeds; and a pair of Eider Ducks by Mr. W. H. St. Quinting, Scampston Hall. The ducks were bred in captivity.

Mr. William Hiscoe has supplemented his last year's gift of coal fossils, from the Brown Metal Beds of the Coal Measures, at Gildersome Tunnel, by a small series of fossils of great interest from the same beds. Another very acceptable addition to the Geological collections is a fine specimen of *Ammonites athleta*, from the Oxford clay, given by Mr. W. G. Fearnside, of Sidney Sussex College, Cambridge.

To the Ethnological collection have been added a Man-trap, the gift of Mrs. George Roberts, Lofthouse, and two Jujus or fetishes from the Niger Coast Country, presented by Mr. Cuthbert E. Harrison, of the Niger Coast Protectorate.

Mr. Kenneth Teale, New Wortley, Leeds, has given a mahogany dust-proof case, with plate glass sides, for the display of the Golden and Amherst Pheasants in the bird collection. This case has been designed by the donor to demonstrate the possibility of excluding dust from museum cases, even if the buildings be situate in the centre of a city.

The efforts of the Council to improve the ventilation of the Lecture Theatre have continued during the session. The air-ways were thoroughly cleared, and an attempt made to render the existing means of ventilation more efficient. The improvement effected has, however, not been all that was expected, and the Council are persuaded that a radical change

in the system will have to be made, and that considerable expense must be entailed. A comprehensive scheme is now under consideration of the Council.

Some important changes have been made during the past Session in the staff of the Society. Mr. W. F. Husband, LL.B., who has been Secretary of the Society since 1876, has vacated his office in order that he may give his whole time to the greatly increased administrative work of the Yorkshire College. This step was the outcome of a conference between representatives of the Society and the College. The Council desire to record their sense of the able and zealous services rendered to the Society for so long a period by Mr. Husband, who has shewn the most vigilant interest in all that concerned the welfare of the Society.

It is not intended to maintain the office of paid Secretary. The routine secretarial work will in future be carried on by the Curator, and the Honorary Secretaries propose to give more time to the affairs of the Society, in order that the Curator may be able to give undiminished attention to the collections.

The Council are glad to state that the above-named changes have enabled them to make a substantial increase in the salary of the Curator, Mr. Henry Crowther, whose services they have highly appreciated.

The Council deeply regret to have to record the loss by death of two valued colleagues. Mr. Thomas Scattergood died on February 22nd, and Mr. Richard Reynolds on April 5th, 1900.

Mr. Scattergood had been a member of the Council of the Society from 1876. He attended the meetings with great regularity, and showed an unflagging interest in the welfare of the Society. His wise counsel has been of the utmost value to the Society, and his colleagues repeatedly desired

that he would accept some acknowledgment of their esteem by consenting to nomination for the presidency of the Society. Mr. Scattergood, however, preferred to forego this honour. The Council feel that in Mr. Scattergood the Society has lost one of its best friends, and Leeds a citizen whose personal qualities and public services commanded the most sincere respect and admiration.

The connection of Mr. Richard Reynolds with the Society was of the most intimate and important kind. He became a member of the Council in 1865, and held the office of Honorary Secretary from 1870 until 1891. From 1891 he remained an active member of the Council, and indeed within a few days of his death he gave evidence of how sincerely he continued to keep at heart the interests of the Society which he had served so long. It would be difficult to do justice to the value of Mr. Reynolds' services to the Philosophical Society. As Honorary Secretary he gave ungrudgingly of his time and thought to the Society's affairs, and throughout his long connection with them he spared no effort to promote the usefulness and prosperity of the Society and its work. He was himself a diligent meteorological observer, and his registers of sunshine and earth-temperatures, with his own comments upon the results, have long been a feature of our annual reports. Mr. Reynolds' long and valuable services to the Society would have been recognised by his election as President, if his consent could have been obtained.

Both Mr. Scattergood and Mr. Reynolds were active supporters of the Yorkshire College. Together with the late Dr. Heaton and others whose names are still remembered, they maintained that friendly relation between the two institutions which has subsisted ever since the College came into existence.

During the past Session two hon. members of the Society have died—Sir W. Dawson, C.M.G., LL.D., F.R.S., etc., and the Rt. Hon. The Earl of Lonsborough.

Sir W. Dawson was emeritus Principal and Chancellor of the McGill University, Montreal, and the most distinguished of Canadian geologists. He was knighted in 1884, when the British Association paid its first visit to Canada. In 1886 he was President of the Birmingham meeting of the British Association. Sir W. Dawson lectured to the Philosophical Society in the Session 1883-4.

The Earl of Londesborough, who died on April 19th, was the second Peer and the first Earl. He was elected an hon. member of the Society in 1864, and was a donor to the Building Fund and to the Museum.

*Summary of Meteorological Observations taken at the Philosophical Hall,
and at Woodhouse Cliff, Leeds, during the year 1899.*

1899.	Mean Height of Barometer (inches).	Mean Temperature of Air (degrees).	Mean Temperature of Earth (degrees).	Amount of Rainfall.	
				Museum (inches).	Woodhouse Cliff (inches).
January	29'54	41'0	40'4	3'38	3'48
February	29'60	41'3	39'3	1'27	1'48
March	29'78	42'6	39'1	1'04	1'19
April	29'49	45'7	42'6	1'67	1'79
May	29'75	50'2	47'5	2'87	3'01
June	29'82	61'9	54'6	1'39	1'44
July	29'81	63'7	57'8	1'47	1'62
August	29'85	64'4	58'0	1'57	1'52
September	29'53	55'4	54'6	3'07	3'21
October	29'79	48'9	47'7	2'15	2'16
November	29'81	48'7	45'8	'89	1'16
December	29'56	37'3	40'8	2'55	2'48
Yearly Means ...	29'69	50'0	47'3	23'52	24'54

EXTREMES FOR THE YEAR.

Greatest Barometric pressure—30'55 inches on November 16th and January 26th, the Temperature of the Mercury being 51° and 38° F.; Least pressure—28'24 on December 29th, the Temperature of the Mercury being 42°.

Greatest degree of Heat, indicated by the Thermometer in the shade—86° on July 30th, 31st, and August 1st; Minimum—21° on December 16th and 28th.

Lowest Earth Temperature was 37'3° on March 26th; the Highest 59'0° on August 4th.

Greatest fall of Rain (during 24 hours)—'98 inches on September 29th. Average yearly Rainfall at the Museum for the ten years 1890—1899, 25'65 inches.

RELATIVE SUNSHINE AT THE URBAN AND RURAL STATIONS,
THE MUSEUM AND ADEL.

Deficiency of Museum from Adel:—

1889-90	33'4 per cent.	1895-96	19'3 per cent.
1891-92	30'5 „	1897-98	18'7 „
1893-94	20'0 „	1898-99	17'2 „

The adopted Mean Temperature of the Air is the mean of the following four daily readings:—(a. and b.) Dry Bulb Thermometer read at 10 a.m. and 4 p.m.; (c. and d.) Maximum and Minimum Thermometers, in a screen.

The Readings of the Earth Thermometer are taken by a Symons' instrument, exposed at a depth of 2 feet 6 inches below the ground at Woodhouse Cliff, and read at 10 a.m. The monthly returns are the means of the daily readings.

The Hall is situated at 1° 32' 45" W., and 53° 47' 51" N.

The Bench Mark at the corner of the Philosophical Hall is 131'8 feet above sea level, and 10 inches above the pavement. The Cistern of the Barometer is 12'8 feet, the Thermometers are 42 feet, and the Rain-gauge is 45 feet above the Bench Mark.

SUNSHINE AT LEEDS IN 1899.

The observations recorded below were made by Jordan's Photographic Sunshine Recorder at the following stations in Leeds:—

1. The Museum of the Philosophical and Literary Society, situate in the centre of the city; elevation above the sea, 145 feet.
2. Woodhouse Cliff, 1½ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the city.

Months.	Stations.	Hours of sunshine registered. °	Percentage of possible Duration.
JANUARY	1	19'40	8'1
	2	30'40	12'7
	3	10'50	16'9
FEBRUARY	1	57'00	21'3
	2	67'30	25'2
	3	79'50	32'3
MARCH	1	123'20	33'9
	2	148'50	40'8
	3	171'35	47'1
APRIL	1	108'45	26'0
	2	122'45	29'3
	3	129'00	30'8
MAY	1	150'15	30'5
	2	174'35	35'4
	3	172'45	35'1
JUNE	1	223'10	44'1
	2	237'50	47'0
	3	244'30	48'3
JULY	1	176'00	34'7
	2	191'00	37'7
	3	192'30	38'0
AUGUST	1	178'40	39'2
	2	218'10	47'9
	3	221'40	49'0
SEPTEMBER	1	134'20	35'9
	2	139'10	36'7
	3	155'50	41'6
OCTOBER	1	87'20	27'2
	2	101'50	31'8
	3	114'40	35'8
NOVEMBER	1	33'40	13'5
	2	35'20	14'1
	3	34'10	13'7
DECEMBER	1	8'30	3'3
	2	16'20	7'3
	3	12'50	5'7

SUMMARY FOR THE YEAR.

Hours recorded.		Difference from mean of ten years in hours.		Percentage of possible duration.
	H. M.	H. M.		
Museum ..	1,300 40	+178 41	..	29'46
Woodhouse Cliff ..	1,484 00	+169 24	..	31'35
Lawnswood ..	1,570 10	+131 29	..	35'57
32'1 per cent. mean for 1899.		29'0 per cent. mean for 1894.		
27'8	1898.	31'6	1893.	
31'4	1897.	27'5	1892.	
26'5	1896.	22'2	1891.	
37'5	1895.	24'4	1890.	
or 29'0 per cent. mean for ten years.				

The Meteorological Office publishes the following Records of Sunshine for 1899, as observed at station taken as representing specified districts:—

Stations.	Number of Hours.	Difference from mean, hours.	Percentage of possible duration.
Scotland, N. (Stornoway, &c.)	1,211	+140	27
.. E. (Aberdeen, Marchmont)	1,340	+ 65	30
.. W. (Glasgow; Douglas, Isle of Man) ..	1,350	+ 8	31
England, N.E. (Durham, York)	1,356	+111	31
.. N.W. (Stonyhurst, Blackpool, Llandudno)	1,666	+262	36
.. Mid. (Cirencester, Oxford, &c.)	1,627	+302	38
.. S. (London, Hastings, Southampton, &c.)	1,683	+355	44
.. E. (Hillington, Geldestone, Cambridge)	1,864	+270	41
.. S.W. (Pembroke, Falmouth, Plymouth, &c.)	1,907	+258	43
Ireland, N. (Armagh, Markree Castle) ..	1,405	+128	32
.. S. (Dublin, Parsonstown, Valencia) ..	1,611	+168	37
Channel Islands (Jersey)	2,117	+292	50

SUMMARY.

36'6 per cent. mean for United Kingdom, 1899.	31'1 per cent. mean for United Kingdom, 1894.
33'5	1893.
34'1	1892.
31'8	1891.
35'8	1890.
or 33'84 per cent. mean for ten years.	

LIST OF PRESIDENTS

SINCE

THE FOUNDATION OF THE SOCIETY.

1821—5.	JOHN MARSHALL.
1826 & 7.	Rev. W. H. BATHURST, M.A.
1828—30.	MICHAEL THOS. SADLER, M.P.
1831 & 2.	WILLIAM HEY.
1833 & 4.	JAMES WILLIAMSON, M.D.
1835 & 6.	Rev. JOSEPH HOLMES, M.A.
1837—9.	Rev. RICHARD WINTER HAMILTON
1840 & 1.	ADAM HUNTER, M.D.
1842—4.	JOHN HOPE SHAW.
1845—50.	Rev. WILLIAM SINCLAIR, M.A.
1851.	WILLIAM WEST, F.R.S.
1852 & 3.	Rev. CHARLES WICKSTEED, B.D.
1854—6.	JOHN HOPE SHAW.
1857.	JAMES GARTH MARSHALL, F.G.S.
1858.	Rev. W. F. HOOK, D.D.
1859 & 60.	Rev. ALFRED BARRY, M.A.
1861 & 2.	THOS. PRIDGIN TEALE, F.R.S.
1863—5.	Rev. THOS. HINCKS, B.A.
1866 & 7.	CHARLES CHADWICK, M.D.
1868—71.	JOHN DEAKIN HEATON, M.D.
1872 & 3.	Rev. CANON WOODFORD, D.D.
1874 & 5.	J. I. IKIN, F.R.C.S.
1876 & 7.	Rev. J. H. MCCHEANE, M.A.
1878—80.	T. CLIFFORD ALBUTT, M.D., F.L.S.
1881 & 2.	Rev. JOHN GOTT, D.D.
1883 & 4.	J. E. EDDISON, M.D.
1885.	EDWARD ATKINSON, F.L.S.
1886—8.	THOMAS MARSHALL, M.A.
1889—91.	THOS. PRIDGIN TEALE, M.A., F.R.S.
1892 & 3.	Rev. J. H. D. MATTHEWS, M.A.
1894 & 5.	Rev. CHARLES HARGROVE, M.A.
1896 & 7.	EDMUND WILSON.
1898 & 9.	NATHAN BODINGTON, M.A., Litt.D.
1900.	J. H. WICKSTEED, M.Inst.C.E.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Expenses for the year 1899-1900.

[illegible]

We have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.

LEEDS, May 12th, 1900.

BLEVERS & ADGIE,
CHARTERED ACCOUNTANTS.

Capital Account.

£2,270 Preference 2½ per cent. Midland Railway Stock.

LIST OF DONATIONS AND ADDITIONS

TO THE
SOCIETY'S MUSEUM AND LIBRARY.

1899-1900.

PUBLICATIONS.

Catalogue of Welwitsch's African Plants, Vol. II., Part I.	} The Trustees of the British Museum.
List of the Genera and Species of Blastoidea	
Handbook of the Genera and Species of Birds, Vol. I.	
Curiosities of Light and Sight, by Shelford Bidwell, F.R.S.	} The Author.

PERIODICALS.

WEEKLY.

Nature Purchased.

MONTHLY.

Annals and Magazine of Natural History	} Purchased.
Geological Magazine	
Journal of the Chemical Society	Purchased.
Monthly Notices of the Royal Astro- nomical Society	} The Society.
Philosophical Magazine and Journal of Science	

BI-MONTHLY.

Journal of the Royal Microscopical
Society } The Society.

QUARTERLY.

Quarterly Journal of Microscopical Science	Purchased.
Quarterly Journal of Geological Society	The Society.
Quarterly Returns of Marriages, Births, and Deaths.....	Registrar-General.
Journal of the Anthropological Institute	The Institute.
Zeitschrift für Wissenschaftliche Zoologie	Purchased.
Journal of the Linnean Society	Mr. Edward Atkinson, F.L.S.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions.....	Purchased.
Proceedings of the Royal Society ...	The Society.
Proceedings of the Royal Institution of Great Britain	The Institution.
Publications of the Ray Society	Purchased.
Fauna Gaskohle, Bd. IV., Heft 2.....	Purchased.
Students' Flora of New Zealand and the Outlying Islands, by Thos. Kirk, F.L.S.	The Government, New Zealand.
Biological Experimentation, its Function and Limits, by Sir B. W. Richardson, F.R.S.	Presented.
Abridgments of Specifications for Patents, Period 1884—88 ; 1889—92	The Comptroller - General of Patents.
British Association Report.....	The Association.
Greenwich Observations.....	The Astronomer-Royal.
Memoirs of the Royal Astronomical Society	The Society.
Radcliffe Astronomical and Meteorological Observations	Radcliffe Trustees.
Symons's British Rainfall	Purchased.
Monograph of the Palæontographical Society	Purchased.

Proceedings of the Yorkshire Geological and Polytechnic Society.....	} The Society.
Transactions of the Leeds Geological Association	} The Association.
Leeds Free Library Annual Report. Catalogues:—D. Sociology; K. Science, Art and Technology; O. Geography, Voyages, Travels; M. Biography; B. Natural Science and Medical Works; H. Miscellaneous Literature	} The Chief Librarian.
Proceedings of the Liverpool Geological Society.....	} The Society.
Journal of the Liverpool Geological Association	} The Association.
Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne.....	} The Tyneside Naturalists' Field Club.
Proceedings of the Birmingham Philosophical Society	} The Society.
Annual Report of the Yorkshire Philosophical Society	} The Society.
Transactions of the Leicester Literary and Philosophical Society	} The Society.
Report of the Committee of Leicester Town Museum	} The Museum.
Report of the Royal Institution, Hull	The Institution.
Report of the Meteorological Department of the Borough of Southport.	} The Meteorological Observer.
Report of the Bristol Museum	The Museum Committee.
Report of the Reading Museum	{ The Free Library and Museum Committee
Annual Report of the Brighton Town Museum	} The Museum.
Annual Report, Middlesex Hospital...	The Hospital.
Annual Report of the Birkenhead Literary and Scientific Society	} The Society.
Proceedings of the Liverpool Literary and Philosophical Society	} The Society.

Annual Report and Proceedings of the Liverpool Science Students' Association	}	The Association.
Memoirs and Proceedings of the Man- chester Literary and Philosophical Society	}	The Society.
Transactions of the Manchester Geo- logical Society	}	The Society.
Reports of the Manchester Museum Handbooks do. do.	}	The Keeper.
Annual Report of the Sheffield Literary and Philosophical Society	}	The Society.
Annual Report of the Chester Society of Natural Science and Literature	}	The Society.
Transactions of the Leeds Naturalists' Club and Scientific Association.....	}	The Association.
Journal of the Royal Institution of Cornwall	}	The Institution.
Annual Report of the Royal Cornwall Polytechnic Society.....	}	The Society.
Report of Associated Architectural Societies	}	The Association.
Journal of the Chester Archæological and Historic Society	}	The Society.
Geological Record		Purchased.
Transactions of the Yorkshire Natural- ists' Union ..	}	The Union.
Proceedings of the Royal Society of Edinburgh	}	The Society.
Transactions do. do.	}	
Transactions of the Edinburgh Geo- logical Society.....	}	The Society.
Proceedings of the Glasgow Philoso- phical Society	}	The Society.
Proceedings of the Berwickshire Naturalists' Club	}	The Club.
Scientific Proceedings of the Royal Dublin Society.....	}	The Society.
Scientific Transactions do.	}	

Transactions of the Royal Irish Academy	} The Academy.
Proceedings do. do.	
Journal of the Royal Geological Society of Ireland	} The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club }	
Publications of the Royal Swedish Academy of Sciences.....	} The Academy.
Papers of the Royal University of Norway	
Bulletin of the Geological Institution of the University of Upsala	} The Institution.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhandling.....	
Bulletin, Société Impériale, Moscow...	} The Society.
"Leopoldina" Amtliches organ der Kaiserlichen, Leopoldino-Carolinischen Deutschen Akademie der Naturforscher	
Mittheilungen der Kais. Königl. Geographischen Gesellschaft in Wien ...	} The Society.
* Memoirs of the National Academy of Sciences	
Report of Australasian Association for the Advancement of Science.....	} The Association.
Journal and Proceedings of the Royal Society of New South Wales	
Journal of the Royal Geographical Society of Australasia	} The Society.
Wealth and Progress of New South Wales	
Records of the Geological Survey of New South Wales	} The Surveyor.
Memoirs of the Geological Survey of New South Wales	
Annual Report and Papers of the Department of Mines and Agriculture, New South Wales ..	} The Department.

Prodromus of the Zoology of Victoria	The Editor.
Records of the Australian Museum	The Trustees.
Report of the Trustees of the Australian Museum.....	
Proceedings of the Royal Society of Queensland	The Society.
Queensland Agricultural Journal	The Society.
Annals of the Queensland Museum...	The Trustees.
Guide to Queensland	The Government.
Transactions and Proceedings of the New Zealand Institute	The Institute.
Papers and Proceedings of the Royal Society of Tasmania	The Society.
Proceedings and Transactions of the Royal Society of Canada	The Society.
Proceedings of the Canadian Institute	The Institute.
Annual Report do.	
Transactions do.	
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	The Institute.
Annual Report, Hamilton Public Library, Ontario, Canada	The Librarian.
Journal and Proceedings of the Hamilton Association	The Association.
Geological and Natural History Survey of Canada	Department of the Interior.
Annual Report and Papers—do.	
Contributions to Canadian Palæontology	
Bulletin of the Natural History Society of New Brunswick.....	The Society.
Memorias de la Sociedad Científica (Mexico)	The Society.
“ Boletín Mensual ” Observatorio Meteorológico-Magnético Central de Mexico	The Editor.
Anuario del Observatorio Astrónomico Nacional Mexico.....	The Astronomer.
Boletín del Observatorio Astronómico Nacional de Tacubaya	The Observer.

Report of the Museum National, Rio-de-Janeiro.....	}	Directeur-Général.
Archivos do.		
Cape Meridian Observations	}	Cape Astronomer-Royal.
Report of H.M. Astronomer at the Cape of Good Hope to the Secretary of Admiralty		
Transactions of the American Philo- sophical Society		
Proceedings do.	}	The Society.
United States Geological Survey, Annual Report.....		
Contributions to American Ethnology. United States Geographical and Geo- logical Survey	}	The Department.
United States Department of Agricul- ture, Publications of		
Jumping Mice of the Genus <i>Zapus</i> ...	}	The Department.
Report of the Smithsonian Institution Smithsonian Miscellaneous Collections Smithsonian Contributions		
Annual Reports of the Bureau of Ethnology	}	The Institution.
Miscellaneous Publications of the Bureau of Ethnology		
Proceedings of United States National Museum	}	The Museum.
Report do. do.		
Bulletins do. do.		
Transactions of the Academy of Science of St. Louis	}	The Academy.
Proceedings of the Academy of Natural Sciences of Philadelphia...		
Papers do. do.	}	The Academy.
Proceedings of the American Academy of Arts and Sciences.....		
Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	}	The Academy.
Memoirs of the National Academy of Sciences, Washington.....		

Proceedings of the Davenport Academy of Natural Science.....	The Academy.
Transactions of the Wagner Free Institute of Science, Philadelphia ...	The Institute.
Annual Report, Transactions, and Miscellaneous Papers of the Historical and Scientific Society of Manitoba	The Society.
Annual Report of the Trustees of the Cooper Union for the Advancement of Science	The Union.
Proceedings of the Boston Society of Natural History, U.S.A.....	The Society.
Memoirs do.	
Bulletins of the Essex Institute, U.S.A.	The Institute.
Annual Report of the Curator of the Museum of Comparative Anatomy, Harvard College	The College.
Annual Report of Harvard College	
Harvard University Catalogue	The University.
Annual Report of the Chicago Academy of Sciences.....	The Academy.
Transactions of the Astronomical Observatory of Yale University ...	
Annual Report do.	
Report of the President of Yale University	The University.
Catalogue do. do.	
Journal of the Elisha Mitchell Scientific Society	The Society.
Tufts College Studies.....	The College.
Transactions of the Meriden Scientific Association	The Association.
Transactions of the Botanical Society of America	The Society.
Bulletins of the Wisconsin Geological and Natural History Society..	The Society.
Botanical Society of America	Society, Cornell University.
Bulletins of the Buffalo Society of Natural Sciences..	The Society.

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- 74 Tottie, Mrs. John William

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102-3	Gott, William Henry (P) (9 shares)	.
106-10		
114-15		
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81	*Holroyd, James	.
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39	*Lawson, John	.
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| Grant, Prof. Arthur J., M.A. | . 13, Cromer Terrace. |
| Green, John H. | . Horbury, near Wakefield. |
| Green, William | . 1, Tanfield Place. |
| Hannam, William Simpson | . 4, East Parade. |
| Harper, Alfred | . Eccleshill, near Bradford. |
| Hartley, Prof. R. N., M.B. | . 2, Clarendon Road. |
| Hassé, A. | . 31, Commercial Street. |
| Hellier, J. B., M.D. | . 1, De Grey Terrace. |
| Hindle, J. E. | . 10, Park Row. |
| Hirsch, Paul | . Alma House, Headingley. |
| Holbrook, W. | . St. Ann's Villas, Monkbridge Rd. |
| Jefferson, Miss M. | . 4, Woodhouse Square. |
| Jones, Mrs. | . Greek St. Chambers, Park Row. |
| Josephy, Bernard | . 25, Hyde Terrace. |
| Josephy, Henry | . 5, Beech Grove Terrace. |
| Keenan, Mrs. | . Breakcliffe, Bramley. |
| Kirk, Albert E. | . 13, Bond Street. |
| Kitson, F. J. | . Oatlands, Burley, Leeds. |
| Kitson, Sydney D. | . 12, East Parade. |
| Lawson, Arthur T. | . Weetwood Grange, Far Headingley. |
| Lean, W. Scarnell, M.A. | . 5, Woodsley Terrace. |
| Littlewood, H., F.R.C.S. | . Park Square. |
| Mackey, W. M., F.C.S. | . Victoria Chambers, South Parade |
| Megson, Albert | . Spencer Place, New Leeds. |

Millard, F. H.	. 52, Cardigan Road.
Moorman, F. W., B.A., Ph.D.	. Hollin Lane, Far Headingley.
Mozley, J. R., M.A.	. 1, Holly Bank, Far Headingley.
Murphy, Albert J.	. Preston House, Tonbridge Street.
Newill, Frank	. 9, Kelso Road.
Newstead, J. S.	. Woodville, Horsforth.
Nicholson, John Carr	. Moorfield House, Headingley.
Nixon, S. E.	. St. Chad's Hill, Far Headingley.
Oates, C. G.	. Meanwoodside.
Peate, Jonathan	. Guiseley.
Pepper, J. E.	. 42, Hyde Terrace.
Phillips, John Henry	. Hazel House, Methley.
Powell, Miss	. Girls' High School, Leeds.
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Robinson, Edmund	. 42, Park Square.
Rogers, Prof. L. J., M.A., Mus.Bac.	. 13, Beech Grove Terrace.
Sanders, T. W.	. 5, Blenheim Square.
Scatcherd, Mrs. Oliver	. Morley, near Leeds.
Sherburn, F.	. 153, Woodhouse Lane.
Smith, Dr. Thomas	. Leathley Lodge, Hunslet Road.
Smith, H. Archbold	. Holly Bank, Far Headingley.
Stables, Marshall	. Armley Grange.
Stephenson, George	. Yorkshire College, Leeds.
Stockdale, Mrs. T.	. Spring Lea.
Sykes, Arthur	. Roundhay Grange.
Talbot, Grosvenor	. Southfield, Burley, Leeds.
Taylor, Mrs.	. Buckingham House, Headingley.
Teale, Michael A.	. 5, Blenheim Terrace.
Tetley, C. F., M.A.	. Cardigan Road, Headingley.
Thompson, Vincent T., M.A.	. 195, Belle Vue Road.
Tiffany, Frank	. 3, Kelso Road.
Wager, Harold, F.L.S.	. Bank Villa, Stainbeck Lane.
Walker, Arthur T.	. The Elms, Weetwood.
Walker, H. Secker, F.R.C.S.	. 45, Park Square.
Walker, James	. Newton Park.
Walker, George	. Do.

Ward, Edward, M.A., M.B.	. 22, Park Place.
Ward, J. J.	. 255, Kirkstall Road.
Welton, Prof. James, M.A.	. Yorkshire College.
West, Lionel F., M.R.C.S.	. Morley.
Wilkinson, J. J.	. Burnside, Skipton.
Wilkinson, William	. Surveyor, Altofts, Normanton.
Williamson, H. L.	. 4, St. Chad's Gardens, Far Headingley.
Wilson, D'Arcy B.	. Seacroft.
Wilson, J. R. R.	. 1, St. Mary's Road, Newton Park.
Wood, Thomas	. St. Mark's Tce., Woodhouse Lane.

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Barran, J. N., B.A.	. Do.
Beaumont, Mrs. R.	. 1, Grosvenor Terr., Headingley.
Bedford, Mrs.	. Woodhouse Cliff.
Birch, Mrs.	. 16, De Grey Terrace.
Bompas, Mrs.	. Headingley.
Bompas, Miss Ethel	. Do.
Bompas, Miss Gladys	. Do.
Bompas, Miss Mary	. Do.
Braithwaite, Mrs. R. H	. Kirkstall Lane, Headingley.
Branson, Mrs. F. W.	. Wynneholme, Far Headingley.
Brigg, Miss Mary	. 12, Sholebroke Avenue.
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Cameron, Mrs.	. Ridge Mount, Cliff Road.
Carter, Mrs. J. H.	. 26, Park Square.

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Chorley, Mrs. H. S.	. Burley-in-Wharfedale.
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Crampton, Miss	. Parcimon, Roundhay.
Crampton, Edward	. Do.
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Crawford, Mrs. J. W.	. Newton Lane.
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Croysdale, Miss	. Do. do.
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Dalton, Mrs. G.	. Regent Villas, Headingley.
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Foster, Mrs. George	. Bleak House, Harehills.
Gardner, Mrs. Wilson	. 10, Norwood Terr., Headingley.
Glover, Miss H.	. 16, De Grey Road.
Glover, Miss Mary	. Do.
Green, Miss	. 1, Tanfield Place.
Green, Miss Ethel	. Do.
Hannam, Mrs. W. S.	. 4, East Parade.
Hellier, Mrs.	. 1, De Grey Terrace.
Hepper, Miss M. E.	. Clareville, Headingley.
Hirsch, Mrs. Paul	. Alma House, Headingley.
Hirsch, Miss	. Do.
Holbrook, Mrs.	. St. Ann's Villas, Monkbridge Rd.
Josephy, Mrs. B.	. 25, Hyde Terrace.
Josephy, Miss B.	. Do.
Josephy, Mrs. H.	. 5, Beech Grove Terrace.
Josephy, Miss	. Do.
Josephy, Hermann	. Do.
Keenan, Miss	. Breakcliff, Bramley.
Kitson, Mrs. F. J.	. Oatlands, Burley, Leeds.
Lane, Miss	. Girls' High School, Leeds.
Lupton, Mrs. Arnold	. 6, De Grey Road.

Mathers, Miss	. Hanover House.
Millard, Mrs.	. 52, Cardigan Road.
Moorman, Mrs.	. Hollin Lane, Far Headingley.
Nelson, Miss C. E.	. St. John's Cottage, St. John's Rd.
Nelson, Miss Louisa	. Do. do.
Newill, Miss	. 9, Kelso Road.
Nicholson, Miss	. Moorfield House, Headingley.
Nicholson, Wilfred E.	. Do. do.
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Nussey, Miss	. Potternewton Hall.
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Pepper, Mrs. J. E.	. 42, Hyde Terrace.
Phillips, Miss Dorothy	. Hazel House, Methley.
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Porter, Miss	. Flower Bank, Burley.
Ramsbotham, Miss E. J.	. 16, Park Place.
Redmayne, Mrs. John	. Grove House, Headingley.
Richardson, Mrs.	. 1, Montpellier Terrace.
Ryder, Miss E. I.	. Gledhow Hill.
Ryder, Miss Louisa	. Do.
Scattergood, Miss	. 41, Park Square.
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Stockdale, Miss M. B.	. Spring Lea, Springfield Mount.
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Talbot, Mrs. G.	. Southfield, Burley.
Talbot, Miss	. Do.
Taylor, Miss	. Buckingham House, Headingley.
Taylor, T. L.	. Do. do.
Teale, Miss	. North Grange, Headingley.
Tetley, Mrs. C. F.	. Cardigan Road, Headingley.
Tiffany, Mrs. Frank	. 3, Kelso Road.

Wager, Mrs.	. Bank Villa, Chapel-Allerton.
Walker, Mrs. A. T.	. The Elms, Weetwood.
Walker, Miss E. H.	. Newton Park.
Walker, Miss M. H.	. Do.
Walker, Miss M. I.	. Do.
Ward, Mrs. G.	. . Buckingham Terrace.
Webb, Miss	. Aire Street.
Williamson, Mrs. H. L.	. 4, St. Chad's Gardens, Far Headingley.
Willson, Miss Emilie Dorothy	. Ballamona, Headingley.
Willson, Miss Margaret	. Do.
Wilson, Mrs.	. 1, St. Mary's Road, Newton Park.
Wood, Miss	. St. Mark's Terr., Woodhouse Lane

Members and Subscribers are requested to inform the Curator of any errors that may be found in the above list.

HONORARY MEMBERS.

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|---|--|

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THE
EIGHTY-FIRST REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1900-1901.

READ AT THE ANNUAL MEETING, MAY 7th, 1901.

LEEDS :
JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS, ALBION STREET.

1901.

THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY consists of the following Classes of Members and Subscribers:—

- (1.) ORIGINAL PROPRIETARY MEMBERS (holding £100 Shares), who are entitled to personal admission to the Museum, Library, Lectures, and all other Meetings of the Society, and to two transferable tickets to admit visitors to the Lectures. They are exempt from Annual Subscription.
- (2.) NEW PROPRIETARY MEMBERS (holding £50 Shares), who are entitled to similar personal privileges, and to two transferable tickets. Subscription, £1 1s. per annum.
- (3.) ORIGINAL ORDINARY MEMBERS (holding £3 3s. Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £2 2s. per annum.
- (4.) NEW ORDINARY MEMBERS (holding £20 Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £1 1s. per annum.

The following are entitled to personal admission to the Museum, Library, and Lectures, but not to business meetings; nor have they any transferable tickets to admit visitors:—

- (5.) HONORARY MEMBERS, elected on the recommendation of the Council.
- (6.) SUBSCRIBERS of £1 1s. per annum.
- (7.) SUBSCRIBERS of 7s. 6d. per annum, being Ladies or Young Persons resident with Members, or with Subscribers in Class (6).

A list of shares offered for sale is kept in the office, and information as to price, &c., may be obtained from the Curator.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members, voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE END OF THE

EIGHTY-FIRST SESSION.

During the past Session the change of hour of the Society's lectures from 7.30 to 8 p.m., which was decided upon at the Council Meeting, on May 29th, 1900, in accordance with the votes of a considerable majority of the members, has been carried into effect. The consequence has been a better attendance at the lectures, but there has been also, as an immediate result, a decrease in the number of subscribers. Most of the resignations are stated to be due to the inconvenience of the new lecture hour to those who have to travel some distance to their homes. It is however, quite probable that when the altered hour of lecture becomes more generally known, the loss of old subscribers will be compensated by the influx of new ones.

The Members and Subscribers are comprised in the following classes :—

	1900.	1901.
Original Proprietary Members	64	63
New Proprietary Members	78	77
Ordinary Members	2	2
New Ordinary Members	59	57
Annual Subscribers of 21s.	118	101
Annual Subscribers of 7s. 6d.	104	78
	<hr/> 425	<hr/> 378

The thanks of the Society are due to Sir Andrew Noble, Professor Smithells, and Mr. Harold Wager for valuable scientific lectures which they delivered gratuitously during the past Session.

The full Lecture list is as follows:—

- 1.—“Modern Explosives.” By SIR ANDREW NOBLE, K.C.B., F.R.S.
Oct. 30th, 1900.
- 2.—“Facts and Fancies about India.” By SIR WILLIAM LEE-WARNER,
K.C.S.I. *Nov. 6th, 1900.*
- 3.—“China and its Puzzle.” By the Rev. W. T. A. BARBER, M.A.
Nov. 20th, 1900.
- 4.—“Travels in the Eastern Himalaya.” By E. J. GARWOOD, M.A.,
F.G.S. *Dec. 4th, 1900.*
- 5.—“A Tour Abroad with Ruskin.” By W. G. COLLINGWOOD, M.A.
Dec. 18th, 1900.
- 6.—“The Emotional Element in Music.” By W. H. HADOW, M.A.,
Mus. Bac. *Jan. 8th, 1901.*
- 7.—“Recent Discoveries in Astronomy.” By H. F. NEWALL, M.A.
Jan. 15th, 1901.
- 8.—“The Flow of a Liquid.” By PROF. H. S. HELE-SHAW, LL.D.,
F.R.S. *Feb. 5th, 1901.*
- 9.—“Shakespeare in Relation to his Contemporaries in Art.” By SIR
WYKE BAYLISS, F.S.A. *Feb. 19th, 1901.*
- 10.—“Liquid Air.” By PROF. ARTHUR SMITHELLS, B.Sc. *March 5th,*
1901.
- 11.—“The Structure of Metals.” By PROF. J. A. EWING, M.A., F.R.S.
March 19th, 1901.
- 12.—“The Borderland between Animals and Plants.” By HAROLD
WAGER, F.L.S. *April 2nd, 1901.*

The vacancy on the Council of the Society caused by the resignation of Mr. J. A. Nunneley on his removal from Leeds, was filled by the election of Mr. Aquila Dodgson.

During the Christmas Holidays, three Museum Lectures were delivered by the Curator, on "The Natural History of a Country Lane;" "Some Uses of Shells by Savage Tribes;" and "The Part that Lime Plays in Nature." The interest in these lectures is well sustained; the attendances have been large, and the appreciation of the objects displayed in the Library at the close of the lectures most encouraging.

An improvement has been effected in the ventilation of the Lecture Hall, by carrying on the south side three encasements from beneath the Hall under the Library into Bond Street, and opening out similar communications from the top of the Lecture Hall, between the ceiling of the Library and floor of the Museum, into the same street. On the north side of the Hall, the ventilation shaft has been raised six feet, and an active current of air established.

Mr. Dodgson, a Member of the Council, who was good enough to undertake last year the arrangement of the Baron Collection of Coins belonging to the Society, has given his attention this year to the Roman section. The inscriptions of the Roman gold coins have all been copied, the coins catalogued and chronologically arranged. To ensure ready reference and replacement, each coin has been numbered to correspond with the catalogue, and a place number on the tray. Of these Roman gold coins, the Society possesses 138, extending over a period of 1,500 years from the "Coins of necessity," issued by the Roman Generals during their wars with Hannibal B.C., 217, to those of Andronicus II., the Byzantine, A.D. 1273-1328.

The inscriptions of the Family or Consular silver coins have also been copied, numbered, and catalogued. The collection contains 272 of these coins, covering a period of two or three centuries B.C., previous to Augustus claiming the sole right to issue gold and silver coins. These have been arranged alphabetically according to the family names, the date of issue being uncertain.

To facilitate the printing of these Catalogues they have been type-written.

The Roman Imperial silver coins—the *Denarii*—have also been chronologically arranged, ticketed, and catalogued, but these still await revision previous to being type-written. The Society's collection contains 425 of these coins, extending over a period of 1,400 years, from Pompey, who bore the title Imperator affixed (B.C. 100-48), to Urosius, the Byzantine Emperor, A.D. 1356.

The 5—600 beautiful sulphur Casts of the best Roman bronze coins in the British Museum have been chronologically arranged, in one of the window cases, in the Savile Room. The temporary labels now affixed will be replaced by printed ones later.

A rearrangement of the Mammals within the cases of the Large Zoological Room, has been made, chiefly with the view of bringing the osteological preparations within easy reference of students. The Collection of Human Skulls has been rearranged on shelves of glass which have the advantage over wood of not casting heavy shadows.

A case illustrating the forms of "Birds' Feet," has been added to the series which is being prepared for display in the Bird Room, describing the modifications and giving the nomenclature of parts of Birds.

The two large cases of Ethnological objects on the north and south sides of the Outer Vestibule have been painted inside a lighter tint of colour, and a number of glass shelves have been fixed, which have permitted of a better display and arrangement of the very valuable collection of these objects which the Society possesses.

The gifts to the Museum during the past year have been numerous and valuable. They include a good series of Australian bird skins, and a mounted specimen of a Parrot, given by Mr. J. W. Marsden, Leeds, to whom the Society owes many gifts of

this kind. Mr. Charles Boshell, formerly of Leeds, has presented a most interesting series of Lepidoptera, and Coleoptera, collected by the donor at Patterson, New Jersey, U.S.A., which contains many species and varieties of these insects which are common to Britain. Mr. W. Howgate, Leeds, has given a mounted specimen of a Tinamou, a South American bird, with singular ornithological affinities, and also a skin of the North American Turkey, and Mr. W. H. St. Quinting, Scampston Hall, York, a specimen of the Capercaillie, in the flesh, from Germany.

A generous donation of the fine collection of British Land and Fresh-water and Marine Shells, got together by the late Mr. Joseph Hebden, a local conchologist of considerable repute, has been made by his widow, Mrs. Hebden, Belle Vue, Wakefield. Many of the specimens are unique, and the Council are pleased to have acquired a collection of objects which will fill a gap in the Society's Museum.

Mr. W. Lindley, Wakefield, has presented a small series of Fossils, from the Carboniferous Limestone of Craven, and Mrs. J. Wilson, of Leeds, a specimen of the tibia of a Moa, found at Hakanui, Oamaru, New Zealand, and a glass case in which it is preserved.

A gift has been made by Mr. Crowther, the Curator, of a portion of the stem, with scales, of a Coal Measure plant—*Lepidophloios auriculatus*, Lsq., a North American form, which this specimen adds to the flora of Britain and Europe. The genus *Lepidophloios* belongs to the family *Lepidodendreae*, and two species, *L. laricinus* and *L. accrosus*, have already being recorded for Yorkshire. The specimen now added to the collections was found twenty years ago by Mr. Arthur Peckett Taylor, of Mapplewell, whilst collecting in the shales of the Middle Coal Measures, at Woolley Colliery, Darton, near Barnsley, and given by him to the donor. The species has been determined by Mr. Walter Hemingway, of Barnsley, who was the fortunate discoverer of the two previous species of the genus *Lepidophloios* recorded for Yorkshire.

The Council note with pleasure the sustained interest taken by students and schools in the Museum Collections. There is also this year a marked increase in the number of ordinary visitors, 25,056 having passed through the turnstile as against 23,111 last year. The greater attention given to the general lighting of the objects by the frequent cleaning of the glass roof, the use of electric lighting in the Inner Vestibule, together with the repainting of the interior of the cases of a lighter tint of colour, and the gradual substitution of glass shelves for those of wood have rendered the museum more attractive.

The Council hope that in the coming year the electric lighting of the Ethnological cases in the Outer Vestibule may be carried out. The varied and valuable objects in these cases always attract the general visitors, who display a deep interest in them and spend a considerable time in their examination.

*Summary of Meteorological Observations taken at the Philosophical Hall,
and at Woodhouse Cliff, Leeds, during the year 1900.*

1900.	Mean Height of Barometer (inches).	Mean Temperature of Air (degrees).	Mean Temperature of Earth (degrees).	Amount of Rainfall.	
				Museum (inches).	Woodhouse Cliff (inches).
January	29'59	40'4	38'2	3'15	3'87
February	29'28	36'7	36'0	3'88	4'64
March	29'77	39'2	38'0	'44	'67
April	29'66	47'6	42'8	1'00	'84
May	29'71	51'1	48'7	1'23	1'19
June	29'67	58'5	52'8	2'57	2'82
July	29'56	64'9	56'6	3'58	3'07
August	29'71	59'5	56'7	5'18	4'77
September	29'88	57'0	54'5	'43	'59
October	29'66	50'3	49'9	3'10	3'21
November	29'51	45'5	45'8	2'80	2'89
December	29'57	46'4	43'4	2'82	3'27
Yearly Means ...	29'63	49'7	46'9	30'18	31'83

EXTREMES FOR THE YEAR.

Greatest Barometric pressure—30'40 inches on September 12th and October 22nd, the Temperature of the Mercury being 59° and 49° F.; Least pressure—28'13 on February 19th, the Temperature of the Mercury being 45°.

Greatest degree of Heat, indicated by the Thermometer in the shade—88° on July 11th, and 12th; Minimum—18° on February 13th.

Lowest Earth Temperature was 34'9° on February 23rd; the Highest 59'7° on July 24th.

Greatest fall of Rain (during 24 hours)—2'13 inches on July 12th. Average yearly Rainfall at the Museum for the ten years 1891—1900, 25'97 inches.

RELATIVE SUNSHINE AT THE URBAN AND RURAL STATIONS,
THE MUSEUM AND ADEL.

Deficiency of Museum from Adel:—

1889-90	33'4 per cent.	1897-98	18'7 per cent.
1891-92	30'5 „	1898-99	17'2 „
1893-94	20'0 „	1900	22'0 „
1895-96	19'3 „		

The adopted Mean Temperature of the Air is the mean of the following four daily readings:—(a. and b.) Dry Bulb Thermometer read at 10 a.m. and 4 p.m.; (c. and d.) Maximum and Minimum Thermometers, in a screen.

The Readings of the Earth Thermometer are taken by a Symons' instrument, exposed at a depth of 2 feet 6 inches below the ground at Woodhouse Cliff, and read at 10 a.m. The monthly returns are the means of the daily readings.

The Hall is situated at 1° 32' 45" W., and 53° 47' 51" N.

The Bench Mark at the corner of the Philosophical Hall is 131'8 feet above sea level, and 10 inches above the pavement. The Cistern of the Barometer is 12'8 feet, the Thermometers are 42 feet, and the Rain-gauge is 45 feet above the Bench Mark.

SUNSHINE AT LEEDS IN 1900.

The observations recorded below were made by Jordan's Photographic Sunshine Recorder at the following stations in Leeds:—

1. The Museum of the Philosophical and Literary Society, situate in the centre of the city; elevation above the sea, 145 feet.
2. Woodhouse Cliff, $\frac{1}{2}$ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the city.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible Duration.
JANUARY	1	19'50	8'2
	2	27'40	11'4
	3	28'30	11'6
FEBRUARY	1	42'40	15'9
	2	54'00	20'2
	3	66'30	24'9
MARCH	1	80'00	21'9
	2	87'40	24'1
	3	99'50	27'4
APRIL	1	153'20	36'6
	2	159'40	38'2
	3	184'50	44'2
MAY	1	151'10	30'7
	2	153'40	32'1
	3	166'30	33'8
JUNE	1	198'00	39'1
	2	202'40	40'0
	3	213'40	42'2
JULY	1	246'50	48'7
	2	241'40	47'4
	3	261'30	51'6
AUGUST	1	147'10	32'3
	2	153'40	33'7
	3	163'40	35'9
SEPTEMBER	1	138'00	36'9
	2	143'50	38'4
	3	158'10	42'3
OCTOBER	1	108'40	33'9
	2	111'20	34'8
	3	123'15	35'0
NOVEMBER	1	22'40	9'1
	2	22'50	9'1
	3	31'40	12'7
DECEMBER	1	14'20	6'4
	2	13'50	6'2
	3	19'20	8'7

SUMMARY FOR THE YEAR.

	Hours recorded.		Difference from mean of ten years in hours.		Percentage of possible duration.	
	H.	M.	H.	M.		
Museum ..	1,134	40	+147	58	..	26'8
Woodhouse Cliff ..	1,372	30	+33	36	..	31'0
Lawnswood ..	1,517	25	+51	19	..	34'3
30'7 per cent. mean for 1900.				37'5	per cent. mean for 1895.	
32'1 ..	1899.			29'0	..	1894.
27'8 ..	1898.			31'6	..	1893.
31'4 ..	1897.			27'5	..	1892.
26'5 ..	1896.			22'2	..	1891.
or 29'6 per cent. mean for ten years.						

The Meteorological Office publishes the following Records of Sunshine for 1900, as observed at stations taken as representing specified districts:—

Stations.	Number of Hours.	Difference from mean, hours.	Percentage of possible duration.
Scotland, N. (Stornoway, &c.)	1,092	+39	25
.. E. (Aberdeen, Marchmont)	1,159	-116	26
.. W. (Glasgow; Douglas, Isle of Man) ..	1,298	-44	29
England, N.E. (Durham, York)	1,261	-67	27
.. N.W. (Stonyhurst, Blackpool, Llandudno)	1,495	+109	33
.. Mid. (Cirencester, Oxford, &c.)	1,397	+75	33
.. S. (London, Hastings, Southampton, &c.)	1,737	+110	39
.. E. (Hillington, Geldestone, Cambridge)	1,680	+72	36
.. S.W. (Pembroke, Falmouth, Plymouth, &c.)	1,734	+85	39
Ireland, N. (Armagh, Markree Castle) ..	1,311	+44	30
.. S. (Dublin, Parsonstown, Valencia) ..	1,489	+16	33
Channel Islands (Jersey)	1,934	+97	45

SUMMARY.

39'6 per cent. mean for United Kingdom, 1900.	35'8 per cent. mean for United Kingdom, 1895.
36'6 ..	31'1 ..
33'5 ..	37'0 ..
34'1 ..	35'2 ..
31'8 ..	32'6 ..
or 34'7 per cent. mean for ten years.	

LIST OF PRESIDENTS

SINCE

THE FOUNDATION OF THE SOCIETY.

1821—5.	JOHN MARSHALL.
1826 & 7.	Rev. W. H. BATHURST, M.A.
1828—30.	MICHAEL THOS. SADLER, M.P.
1831 & 2.	WILLIAM HEY.
1833 & 4.	JAMES WILLIAMSON, M.D.
1835 & 6.	Rev. JOSEPH HOLMES, M.A.
1837—9.	Rev. RICHARD WINTER HAMILTON.
1840 & 1.	ADAM HUNTER, M.D.
1842—4.	JOHN HOPE SHAW.
1845—50.	Rev. WILLIAM SINCLAIR, M.A.
1851.	WILLIAM WEST, F.R.S.
1852 & 3.	Rev. CHARLES WICKSTEED, B.D.
1854—6.	JOHN HOPE SHAW.
1857.	JAMES GARTH MARSHALL, F.G.S.
1858.	Rev. W. F. HOOK, D.D.
1859 & 60.	Rev. ALFRED BARRY, M.A.
1861 & 2.	THOS. PRIDGIN TEALE, F.R.S.
1863—5.	Rev. THOS. HINCKS, B.A.
1866 & 7.	CHARLES CHADWICK, M.D.
1868—71.	JOHN DEAKIN HEATON, M.D.
1872 & 3.	Rev. CANON WOODFORD, D.D.
1874 & 5.	J. I. IKIN, F.R.C.S.
1876 & 7.	Rev. J. H. MCCHEANE, M.A.
1878—80.	T. CLIFFORD ALLBUTT, M.D., F.L.S.
1881 & 2.	Rev. JOHN GOTT, D.D.
1883 & 4.	J. E. EDDISON, M.D.
1885.	EDWARD ATKINSON, F.L.S.
1886—8.	THOMAS MARSHALL, M.A.
1889—91.	THOS. PRIDGIN TEALE, M.A., F.R.S.
1892 & 3.	Rev. J. H. D. MATTHEWS, M.A.
1894 & 5.	Rev. CHARLES HARGROVE, M.A.
1896 & 7.	EDMUND WILSON.
1898 & 9.	NATHAN BODINGTON, M.A., Litt.D.
1900 & 01.	J. H. WICKSTEED, M.Inst.C.E.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Expenses for the year 1900-1901.

RECEIPTS.		£	s.	d.	DISBURSEMENTS.		£	s.	d.
To Balance in hand, May 1st, 1900	...	...	—	17	11	7	...	...	...
Annual Subscriptions, viz.:									
69 New Proprietary Members, at 21s.	...	...	72	9	0	By Repairs and Alterations...	...	...	...
2 Ordinary	...	...	4	4	0	Taxes	...	72	7
52 New Ordinary	...	...	56	14	0	" Fire Insurance	...	25	8
96 Annual Subscribers, at 21s.	...	...	100	15	0	" Coals and Coke	...	12	10
76 Annual Subscribers, at 7s. 6d.	...	...	28	10	0	" Gas and Water	...	29	4
Arrears	...	...	7	14	6	" Cleaning	...	10	15
						" Salaries and Wages	...	5	18
Rent, viz.:						" Collector	...	263	14
Lecture Rooms	...	...	212	13	6	" Auditors	...	12	8
Cellars	...	...	50	0	0	" Collections and Library...	...	2	2
Visitors to Museum...	...	...	262	13	6	" Postages	...	10	3
Sale of Guides	...	...	104	8	0	" Advertising and Printing	...	37	14
Share of cost of Fan in Cellar	...	...	4	18	9	" Lectures	...	130	3
Sundries:—Meteorological Reports, &c...	...	...	7	0	0	" Telephone Co.	...	10	0
			4	2	2	" Porter's Livery	...	6	7
Midland Railway Dividend	...	...	16	0	11	" Sundries	...	11	9
Sale of Forfeited Share	...	...	54	2	11	" Electric Light Supply	...	205	18
			5	0	0	" Balance at the Bank	...	23	2
						" Cash in hand	...	4	5
								33	1
								£730	3
								5	

We have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.

LEEDS, June 8th, 1901.

BEEVERS & ADGIE,
CHARTERED ACCOUNTANTS.

Capital Account.

£2,270 Preference 2½ per cent. Midland Railway Stock.

LIST OF DONATIONS AND ADDITIONS

TO THE

SOCIETY'S MUSEUM AND LIBRARY.

1900-1901.

ZOOLOGY.

Two Eggs of Emeu (<i>Dromæus novæ-hollandiæ</i>).....	} Mr. Alfred White, F.Z.S., Leeds.
Model of Great Auk's egg	
Mounted Specimen of Capercaillie (<i>Tetrao urogallus</i>).....	
Two Eider Ducks (<i>Somateria mollissima</i>). Bred in captivity.....	} Mr. W. H. St. Quinting, Scampston Hall, Rilling- ton.
Capercaillie (<i>Tetrao urogallus</i>). Imported from Germany	
Demoiselle Crane (<i>Grus virgo</i>).....	} Mr. J. W. Marsden, Leeds.
Skins of Australian Birds:—	
Wattled Honey-eater (<i>Anthochaera carunculata</i>); Black-faced Graculus (<i>Graculus melanops</i>); Azure Kingfisher (<i>Alcyon azurea</i>);	
Musk Lorikeet (<i>Glossopsittacus concinnus</i>); Laughing Jackass (<i>Dacco gigas</i>).....	
Mounted Specimen of Parrot	
White Mole (<i>Talpa europæa</i>).....	
A fine series of Lepidoptera and Coleoptera, collected by the donor at Patterson, New Jersey, U.S.A.	
	} Mr. W. Batty, Warther- maske, Masham.
	} Mr. Charles Boshell, Patter- son, N.J.

- Melanic form of Peppered Moth (*Biston betularius*), from Adel, Leeds..... } Dr. Eddison, Adel.
Hedge-hog (*Erinaceus europæus*), }
living, from Adel..... }
- Insects in Spirit, from Syria Mr. Edward Birchall, Leeds.
- Nest of Chaffinch (*Fringilla cælebs*). } Mr. Edward Atkinson,
Newspaper used instead of folia- } F.L.S., Harrogate.
cious Lichens for concealment
- Mounted Specimen of Tinamou }
(*Tinamus*) } Mr. Wm. Howgate, Leeds.
Skin of American Turkey (*Meleagris }
gallipavo*)
- The Collection of British Land, Fresh- } Mrs. J. Hebden, Belle Vue,
water, and Marine Shells, of the late } Wakefield.
Mr. Joseph Hebden, Wakefield..... }

GEOLOGY.

- Fine specimen of *Ammonites athleta*, } Mr. W. G. Fearnside,
with *Arca rhomboida* attached, from } Addingford Hill, Hor-
Oxford clay, St. Neots, Hunts..... } bury.
- A series of Carboniferous Fossil } Mr. Wm. Hiscoe, Beeston
plants, from cutting at Gildersome } Royds.
Tunnel, near Leeds..... }
- Tibia of Moa (*Dinornis*) and case, } Mrs. J. Wilson, Queen
Hakanui, Oamaru, N.Z. } Square, Leeds.
- Specimen of a Fossil plant (*Lepido- }
phloios auriculatus* Lsq.), Barnsley } Mr. Hy. Crowther, F.R.M.S.,
Thick Coal, Mid-coal Measures, } Leeds.
Woolley Colliery, Darton, near }
Barnsley (Species new to Europe).... }
- A small series of Fossils from the } Mr. W. Lindley, St. John's
Carboniferous Limestone..... } Terrace, Wakefield.

MINERALOGY.

- Quartz Geodes, from Illinois side of } Dr. McCrae, Yorkshire
Mississippi Valley, Keokuk, Iowa ... } College.

ETHNOLOGY

- Two fetishes or jujus, with manilla or
native coin attached, from Ogbayan
County, Brass District, Niger Coast
Country, W. Africa..... } Mr. Cuthbert E. Harrison,
Niger Coast Protectorate.

ANTIQUITIES.

- Man-trap } Mrs. George Roberts, East
View, Lofthouse.
Lady's Pellion..... } Mrs. Salts, Littleborough
Vicarage, Manchester.

PHOTOGRAPH.

- Photograph of Head of Kudoo (*Strepsiceros Kudu*), shot at Steytleiville,
Cape Colony. Point of one horn
has grown through the eye-socket... } Mr. Edward Atkinson,
F.L.S., Harrogate.

- Handsome plate-glass, dust-proof
table-case for display of Birds } Mr. Kenneth Teale, Silver
Royd Cabinet Works,
Wortley, Leeds.

PUBLICATIONS.

- Catalogue of Lepidoptera Phalænæ...
Ditto ditto Plates, Vol. II.....
Catalogue of Cretaceous Bryozoa,
Vol. I.
Catalogue of Welwitsch's African
Plants, Vol. I., Part IV.....
Ditto ditto Vol. II., Part I. ...
Hand-list of Birds, Vol. II.
Jurassic Flora, Yorkshire, Part I. ...
Fossil Plants of Wealdon, Part I. } The Trustees of the British
Museum.

PERIODICALS.

WEEKLY.

Nature Purchased.

MONTHLY.

Annals and Magazine of Natural
History } Purchased.
Geological Magazine Purchased.
Journal of the Chemical Society Purchased.
Monthly Notices of the Royal Astro-
nomical Society } The Society.
Philosophical Magazine and Journal
of Science } Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical
Society } The Society.

QUARTERLY.

Quarterly Journal of Microscopical
Science } Purchased.
Quarterly Journal of Geological Society The Society.
Quarterly Returns of Marriages,
Births, and Deaths..... } Registrar-General.
Zeitschrift für Wissenschaftliche Zoo-
logie } Purchased.
Journal of the Linnean Society } Mr. Edward Atkinson,
F.L.S.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions..... Purchased.
Proceedings of the Royal Society ... The Society.
Proceedings of the Royal Institution
of Great Britain } The Institution.
Publications of the Ray Society Purchased.
Fauna Gaskohle, Bd. IV., Heft 3..... Purchased.

Abridgments of Specifications for Patents, Period 1884—88 ; 1889—92	The Comptroller - General of Patents.
British Association Report.....	The Association.
Greenwich Observations.....	The Astronomer-Royal.
Memoirs of the Royal Astronomical Society	The Society.
Radcliffe Astronomical and Meteorological Observations	Radcliffe Trustees.
Symons's British Rainfall	Purchased.
Monograph of the Palæontographical Society	Purchased.
Proceedings of the Yorkshire Geological and Polytechnic Society.....	The Society.
Transactions of the Leeds Naturalists' Club and Scientific Association.....	The Association.
Transactions of the Leeds Geological Association	The Association.
Transactions of the Leeds Astronomical Society	The Society.
Proceedings of the Liverpool Geological Society.....	The Society.
Journal of the Liverpool Geological Association	The Association.
Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne.....	The Tyneside Naturalists' Field Club.
Proceedings of the Birmingham Philosophical Society	The Society.
Annual Report of the Yorkshire Philosophical Society	The Society.
Transactions of the Leicester Literary and Philosophical Society	The Society.
Report of the Committee of Leicester Town Museum	The Museum.
Report of the Royal Institution, Hull	The Institution.
Report of the Meteorological Department of the Borough of Southport.	The Meteorological Observer.
Report of the Bristol Museum	The Museum Committee.

Report of the Reading Museum	{ The Free Library and Museum Committee.
Annual Report of the Brighton Town Museum	{ The Museum.
Annual Report, Middlesex Hospital...	The Hospital.
Annual Report of the Birkenhead Literary and Scientific Society	{ The Society.
Proceedings of the Liverpool Literary and Philosophical Society	{ The Society.
Annual Report and Proceedings of the Liverpool Science Students' Association	{ The Association.
Memoirs and Proceedings of the Man- chester Literary and Philosophical Society	{ The Society.
Transactions of the Manchester Geo- logical Society	{ The Society.
Reports of the Manchester Museum } Handbooks do. do. }	The Keeper.
Annual Report of the Sheffield Literary and Philosophical Society }	The Society.
Annual Report of the Chester Society of Natural Science and Literature }	The Society.
Journal of the Royal Institution of Cornwall	{ The Institution.
Annual Report of the Royal Cornwall Polytechnic Society..... }	The Society.
Report of Associated Architectural Societies	{ The Association.
Journal of the Chester Archaeological and Historic Society	{ The Society.
Geological Record	Purchased.
Transactions of the Yorkshire Natural- ists' Union	{ The Union.
Proceedings of the Royal Society of Edinburgh	{ The Society.
Transactions do. do. }	
Transactions of the Edinburgh Geo- logical Society..... }	The Society.

Proceedings of the Glasgow Philo- sophical Society	} The Society.
Proceedings of the Berwickshire Naturalists' Club	} The Club.
Scientific Proceedings of the Royal Dublin Society.....	} The Society.
Scientific Transactions do.	} do.
Transactions of the Royal Irish Academy	} The Academy.
Proceedings do. do.	} do.
Journal of the Royal Geological Society of Ireland	} The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club }	The Club.
Publications of the Royal Swedish Academy of Sciences.....	} The Academy.
Papers of the Royal University of Norway	} The University.
Bulletin of the Geological Institution of the University of Upsala	} The Institution.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhand- linger.....	} Royal Danish Society of Sciences.
Bulletin, Société Impériale, Moscow...	} The Society.
"Leopoldina" Amtliches organ der Kaiserlichen, Leopoldino-Carolini- schen Deutschen Akademie der Naturforscher	} The Academy.
Mittheilungen der Kais. Königl. Geo- graphischen Gesellschaft in Wien ... }	The Society.
Memoirs of the National Academy of Sciences	} The Academy.
Report of Australasian Association for the Advancement of Science.....	} The Association.
Journal and Proceedings of the Royal Society of New South Wales	} The Society.
Journal of the Royal Geographical Society of Australasia	} The Society.
Wealth and Progress of New South Wales	} The Agent-General.

Records of the Geological Survey of New South Wales	} The Surveyor.
Memoirs of the Geological Survey of New South Wales	
Annual Report and Papers of the Department of Mines and Agriculture, New South Wales	} The Department.
Prodromus of the Zoology of Victoria	
Records of the Australian Museum Report of the Trustees of the Australian Museum.....	} The Trustees.
Proceedings of the Royal Society of Queensland	
Queensland Agricultural Journal	The Society.
Annals of the Queensland Museum...	The Trustees.
Guide to Queensland	The Government.
Transactions and Proceedings of the New Zealand Institute	} The Institute.
Papers and Proceedings of the Royal Society of Tasmania	
Proceedings and Transactions of the Royal Society of Canada	} The Society.
Proceedings of the Canadian Institute Annual Report do.	
Transactions do.	} The Institute.
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	
Annual Report, Hamilton Public Library, Ontario, Canada	} The Librarian.
Journal and Proceedings of the Hamilton Association	
Geological and Natural History Survey of Canada	} Department of the Interior.
Annual Report and Papers—do.	
Contributions to Canadian Palæontology	
Bulletin of the Natural History Society of New Brunswick.....	} The Society.

Memorias de la Sociedad Científica (Mexico)	} The Society.
" Boletin Mensual " Observatorio Meteorologico-Magnetico Central de Mexico	
Anuario del Observations Astrón- omico Nacional Mexico	} The Astronomer.
Boletin del Observatorio Astronómico Nacional de Tacubaya	
Report of the Museum National, Rio-de-Janeiro	} Directeur-Général.
Archivos do.	
Cape Meridian Observations	} Cape Astronomer-Royal.
Report of H.M. Astronomer at the Cape of Good Hope to the Secretary of Admiralty	
Transactions of the American Philo- sophical Society	} The Society.
Proceedings do.	
United States Geological Survey, Annual Report	} The Department.
Contributions to American Ethnology.	
United States Geographical and Geo- logical Survey	
United States Department of Agricul- ture, Publications of	} The Department.
Legislation for the Protection of Birds other than Game	
Revision of American Voles of the genus Microtus	
Report of the Smithsonian Institution Smithsonian Miscellaneous Collections Smithsonian Contributions	} The Institution.
Annual Reports of the Bureau of Ethnology	
Miscellaneous Publications of the Bureau of Ethnology	
Proceedings of United States National Museum	} The Museum.
Report do. do.	
Bulletins do. do.	

Transactions of the Academy of Science of St. Louis	}	The Academy.
Proceedings of the Academy of Natural Sciences of Philadelphia... Papers do. do.	}	The Academy.
Transactions of the Wagner Institute of Science, Philadelphia.....	}	The Institute.
Proceedings of the American Academy of Arts and Sciences.....	}	The Academy.
Transactions of the Botanical Society of America	}	The Society.
Botanical Society of America		Society, Cornell University.
Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	}	The Academy.
Bulletins of the Wisconsin Geological and Natural History Society.. ..	}	The Society.
Memoirs of the National Academy of Sciences, Washington.....	}	The Academy.
Bulletins of the Philosophical Society of Washington.....	}	The Society.
Proceedings of the Davenport Acad- emy of Natural Science.....	}	The Academy.
Transactions of the Wagner Free Institute of Science, Philadelphia ...	}	The Institute.
Annual Report, Transactions, and Mis- cellaneous Papers of the Historical and Scientific Society of Manitoba	}	The Society.
Annual Report of the Trustees of the Cooper Union for the Advancement of Science	}	The Union.
Proceedings of the Boston Society of Natural History, U.S.A.....	}	The Society.
Memoirs do.	}	
Bulletins of the Essex Institute, U.S.A.		The Institute.
Annual Report of the Curator of the Museum of Comparative Anatomy, Harvard College	}	The College.
Annual Report of Harvard College	}	

Harvard University Catalogue	The University.
Annual Report of the Chicago Academy of Sciences.....	The Academy.
Transactions of the Astronomical Observatory of Yale University ...	
Annual Report do.	The University.
Report of the President of Yale University	
Catalogue do. do.	
Journal of the Elisha Mitchell Scientific Society	
Tufts College Studies.....	The College.
Transactions of the Meriden Scientific Association	The Association.
Bulletins of the Buffalo Society of Natural Sciences.. ..	
	The Society.

LIST OF OFFICERS AND COUNCIL,

1901-1902.

OFFICERS.

PRESIDENT	J. H. WICKSTEED, M.Inst.C.E.
VICE-PRESIDENTS.	{ NATHAN BODINGTON, Litt.D. ARTHUR SMITHELLS, B.Sc., F.R.S.
HONORARY SECRETARIES	{ ARTHUR SMITHELLS, B.Sc., F.R.S. E. K. CLARK, M.A., M.Inst.C.E.
TREASURER	RICHARD WILSON.
HONORARY CURATOR IN GEOLOGY	{ R. H. KITSON, B.A.
HONORARY CURATORS IN ZOOLOGY	{ EDWARD ATKINSON, F.L.S. LOUIS C. MIALL, F.R.S.
HONORARY CURATOR IN ETHNOLOGY AND WORKS OF ART	{ J. E. EDDISON, M.D.
HONORARY LIBRARIAN	REV. J. H. D. MATTHEWS, M.A.

The above officers, with the following gentlemen, form the

COUNCIL.

JAMES E. BEDFORD, F.G.S.	HENRY JOHN PALMER.
AQUILA DODGSON.	T. P. TEALE, M.A., F.R.S.
T. WALTER HARDING.	C. T. WHITMELL, M.A., B.Sc.
REV. CHAS. HARGROVE, M.A.	J. J. WILLSON.
THOMAS MARSHALL, M.A.	EDMUND WILSON.

Curator HENRY CROWTHER, F.R.M.S.

LIST OF MEMBERS AND SUBSCRIBERS

1901-1902.

** Members deceased, whose shares have not been transferred.*

PROPRIETARY MEMBERS, EXEMPT FROM ANNUAL SUBSCRIPTIONS.

3	Armitage, Robert	.	Farnley.
4	*Arthington, Robert	.	
54	Bailey, Benson	.	14, Kelso Road.
49	Baines, Mrs. Arthur	.	The Heath, Adel.
5	Baines, Mrs. H. S.	.	16, Mount Preston.
63	Barr, Frederick Horatio, J.P.	.	North Grange Road, Headingley.
6	Barran, Sir John, Bart.	.	Chapel-Allerton Hall.
20	Battye, John	.	Birstal.
22, 24	*Beckett, W., M.P. (2 shares)	.	
18	Bilbrough, Alfred	.	15, Beech Grove Terrace.
8	*Binks, Benj., Junr.	.	
45	Braithwaite, James, M.D.	.	Clarendon Road.
9	*Broadhead, Wm. Henry	.	
11	*Brown, James	.	
13, 14	*Calverley, Edmd. (2 shares)	.	
15	*Charlesworth, C. H.	.	
16	Chorley, Mrs.	.	9, Cavendish Road.
19	Close, James William	.	Greek Street.
26	Cousins, William James	.	Greek St. Chambers, Park Row.
39	Crawford, George Frederic	.	17, East Parade.
21	Cudworth, John W.	.	43, Mount Preston.
23	Dibb, Mrs. Elizabeth	.	
25	Eddison, John Edwin, M.D.	.	6, Park Square.
28	Empson, Christopher	.	Mill Mount, York.
29, 48	Ford, J. R., J.P. (2 shares).	.	Quarrydene, Weetwood.

- 72 Gaunt, Leonard . Hazelbrae, Farsley.
- 36-8 Gott, Wm. Henry (3 shares)
- 61 Greenhow, Wm. T. . Newton Cottage, Chapel-Allerton
- 44 Greenwood, Arthur . 8, Cavendish Road.
- 27 Hall, William . Hillside, Headingley.
- 64 Harding, Thomas Walter . Tower Works, Globe Road.
- 42 Heaton, Beresford R. .
- 30 Horsfall, J., M.A., F.R.C.S.
- 47 Ingham, John P. . 14, East Parade.
- 51 Kinnear, Thos. John, M.A. The Abbey, Malton.
- 43 Lancaster, William Thomas Yorks. Banking Co. Ltd., Leeds.
- 55 *Luccock, Mrs. .
- 34 Lumb, George Denison . 31, Lyddon Terrace.
- 57 Lupton, Charles, M.A. . The Harehills, Roundhay.
- 32 Lupton, Edward Basil . Moorlands, Headingley.
- 53 Lupton, Francis M., M.A. Rockland, Newton Park.
- 56 Lupton, Sydney, M.A. . 102, Park Street, Grosvenor Sq.,
London, W.
- 58 *Makins, Charles .
- 77 Marsh, John Jenks . Cressy House, Woodsley Road.
- 59 *Marshall, Arthur, F.G.S. .
- 60 *Marshall, John, M.A. .
- 66 Marshall, Reginald Dykes Castlerigg Manor, Keswick.
- 67 Marshall, V. A. E., B.A. . Monk Coniston, Ambleside.
- 50 Mason, Charles Letch . The Hollies, Cliff Road.
- 65 Miall, Prof. Louis C., F.R.S. 8, Spring Road, Headingley.
- 7 North, John . North Hill, Roundhay.
- 68 Nunneley, J. A., M.B. . Bath.
- 17 Padgett, Frederick A. . 13, Cookridge Street.
- 46 Raynar, Joseph Percival . Moorfield Lodge, Headingley.
- 70 *Shepherd, John .
- 10 Streatfeild, Richard James. The Rocks, Uckfield, Sussex.
- 71 Tatham, Miss . Springfield Mount.
- 52 *Taylor, Benjamin .
- 73 Teale, Lionel H. . Moorside, Far Headingley.
- 74 Tottie, Mrs. John William

- 35 Truro, The Bishop of . Trenyhton, Par Station, Cornwall.
 75 Walker, Edward . 32, Springfield Mount.
 76 Ward, William . 12, Bank Street.
 2 Warde-Aldam, W. W. . Frickley Hall, Doncaster.
 12 Wilson, Rev. Benjamin . Christ Church Vicarage, Mirfield.
 78 Wilson, Edmund, J.P. . Denison Hall.
 33 Wilson, Henry B. . Westfield, Armley.
 31 Wilson, Richard . Westfield, Armley.
 63 Wilson, Reginald A. . Westfield, Armley.
 40, 41, 69 Wood, William Hoffman . Park Square.
 1 Wurtzburg, John Henry,
 J.P. . 2, De Grey Road.

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 113 Bailes, Richard . Ridge Villa, Meanwood Road.
 116 *Baines, Frederick .
 2 *Balme, E. B. Wheatley, M.A.
 92 Barran, Alfred, J.P. . Moor House, Headingley.
 17 Beaumont, James . St. John's Cottage, Leeds.
 91 Bedford, James . Woodhouse Cliff.
 15 Bilbrough, Wm. Radford . 15, Beech Grove Terrace.
 3 Birchall, Edward . Inglemoor House, Moorland Rd.
 121 Blackburn, Henry G. . 2, East Parade.
 4 *Boothroyd, William .
 89 Boston, Richard . Boar Lane.
 10 Bowling, John . Newstead House, Spencer Place.
 49 Braithwaite, William . Throstle Nest, Horsforth.
 5, 6 Brown, G. W. (2 shares) . 78, Belsize Park Gardens,
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 37 Bulmer, Miss . Blenheim Lodge.
 1 Burrell, Benjamin A., F.I.C. . 5, Mount Preston.

- 86 *Carter, J. B. .
- 9 *Chadwick, William .
- 77 Clark, Edwin Kitson, M.A.,
F.S.A., M.Inst.C.E. . 9, Hyde Terrace.
- 14 Conyers, W. H. . Dunluce, Ben Rhydding.
- 45 *Craven, John .
- 104 Crawford, John William . Newton Lane.
- 26 Elliot, Douglas . 28, Bond Street.
- 19 *Fairbairn, Sir Andrew .
- 118 Flitch, John R. . Moortown.
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- 102-3 }
106-10 } Gott, William Henry (P)
114-15 } (9 shares) .
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- 23 *Hargrave, James .
- 7 Hargrove, Rev. C., M.A. . 10, De Grey Terrace.
- 16 Harvey, William . The Grove, Roundhay.
- 81 Hatch, S. C. .
- 51 Hoggard, Alfred . 25, Cavendish Road.
- 98 Howgate, William . 21, Blenheim Terrace.
- 36 *Hudson, Henry .
- 53 Hudson, Robert . Weetwood Mount, Far Head-
ingley.
- 84 Hummel, Prof. J. J., F.C.S. 152, Woodsley Road.
- 120 Ingham, Samuel . Headingley Hall.
- 56 James, Christopher William Old Manor House, Potternewton.
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 21 Lupton, Oliver . Shireoak Road, Headingley.
 63, } Lupton, Fras. Martineau,
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31	Wilkinson, William M.	. 220, Newton Hill.
85	*Wilson, John	.
35	Wood, Philip T.	.

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13	Stratten, Rev. Canon	. Park Square.

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40	Bodington, Prof. N., Litt.D.	. Shireoak Road, Headingley.
8	*Bolland W. T.	.

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| 7 | Branson, F. W., F.I.C. | Wynneholme, Far Headingley. |
| 15 | Bray, George | Wood Lane, Headingley. |
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| 11 | Briggs, Riley | Springfield Mount. |
| 75 | Brunton, George | Blenheim Terrace, Woodhouse Lane. |
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| 32 | *Dixon, A. S. | . |
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| 6 | Jackson, Richard | 11, Spring Road, Headingley. |
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| 39 | *Lawson, John | . |

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 61 Mason, Charles Letch (P). The Hollies, Cliff Road.
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 52 Nussey, George Henry . St. Ann's, Burley, near Leeds.
 53 Nussey, Obadiah . Morley House, Headingley.
 54 Nussey, Thomas . Bramley Grange, Thorner.
 55 Nussey, Mrs. S. L. . Potternewton Hall.
 56 Nussey, Mrs. Peter . Springville, Headingley.
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 26 Ramsden, Arthur . 20, Cemetery Place, Woodhouse
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 17 Redmayne, John . Grove House, Grosvenor Road.
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THE
EIGHTY-SECOND REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1901-1902.

READ AT THE ANNUAL MEETING, MAY 6th, 1902.

LEEDS:
JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS, ALBION STREET.

1902

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A list of shares offered for sale is kept in the office, and information as to price, &c., may be obtained from the Curator.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members, voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE END OF THE

EIGHTY-SECOND SESSION.

The thanks of the Society are due to The Lord Bishop of Chester, Principal Bodington, Mr. R. P. L. Booker, Mr. J. R. Mozley, and the President (Mr. J. H. Wicksteed) for valuable lectures which they have delivered gratuitously during the past Session.

The full list is as follows :—

- 1.—“ Bishop Berkeley.” By THE LORD BISHOP OF CHESTER. *Oct. 15th, 1901.*
- 2.—“ Walter Scott.” By the Rev. Canon AINGER, LL.D. *Nov. 5th, 1901.*
- 3.—“ The Mycenæan Age in Crete. The Palace at Knossos.” By Principal BODINGTON, Litt. D. *Nov. 19th, 1901.*
- 4.—“ Malaria and Mosquitos ” By Major RONALD ROSS, F.R.S. *Dec. 3rd, 1901.*
- 5.—“ Circumstances in the Life of Amphibia and Reptiles.” By HANS GADOW, M.A., Ph.D., F.R.S. *Dec. 17th, 1901.*
- 6.—“ Protection and Nourishment of young Fish.” By CHARLES STEWART, LL.D., F.R.S. *Jan. 7th, 1902.*
- 7.—“ Roman Roads in Yorkshire.” By R. P. L. BOOKER, M.A., F.S.A. *Jan. 21st, 1902.*
- 8.—“ Exploration amongst the Canadian Rocky Mountains.” By J. NORMAN COLLIE, F.R.S. *Feb. 4th, 1902*

- 9.—“The Poetry of Byron.” By J. R. MOZLEY, M.A., *Feb. 18th, 1902.*
- 10.—“Cathedral Building in France in the Thirteenth Century.” By FRANCIS BOND, M.A. *March 4th, 1902.*
- 11.—“The Evolution of Mountain Scenery.” By J. E. MARR, M.A., F.R.S. *March 18th, 1902.*
- 12.—“Chains; past, present, and possible.” By the PRESIDENT (J. HARTLEY WICKSTEED, M.Inst.C.E.). *April 8th, 1902.*

During the year Mr. Edmund Wilson and the Rev. J. H. D. Matthews have retired from the Council.

Mr. Wilson was a Member of the Council for fifteen years, and during the Sessions 1896-7 and 1897-8 he was President of the Society. The Society owes a great deal to the warm and vigilant interest which Mr. Wilson has taken in its welfare, and it is also indebted to him for the contribution of valuable lectures.

The Rev. J. H. Dudley Matthews, having retired from the Head-Mastership of the Grammar School, and left Leeds, has ceased to be a Member of the Council, to which he belonged for sixteen years. Mr. Matthews was President of the Society during the Sessions 1892-3 and 1893-4, and since 1895 he has occupied the post of Hon. Librarian. Mr. Matthews' participation in the management of the Society has been very active and valuable, and he has been of special service in maintaining the high standard of the lecture programme.

Three Museum Lectures were given by the Curator during the Christmas Holidays, illustrated by lantern views, on “The Romance of a Museum,” “Primitive Man,” and “Life on the Seashore.” A gratifying appreciation of these lectures was shown by the large audiences, which averaged two hundred and fifty persons, in addition to many Members and Subscribers. Much interest was shown, too, in the objects illustrating the lectures which were exhibited at their close.

The Members and Subscribers are comprised in the following classes :—

	1901.	1902.
Original Proprietary Members	63	63
New Proprietary Members	77	76
Ordinary Members	2	2
New Ordinary Members	57	54
Annual Subscribers of 21s.	101	93
Annual Subscribers of 7s. 6d.	78	76
	<hr/>	<hr/>
	378	364

The number of Visitors to the Museum during the year was 23,974; this does not include the 6,197 school children, who made special visits, under the Teachers' Association Scheme. The average number of visitors to the Museum, per annum, for the last ten years is 24,238.

The Museum has been used during the past year by many special students, by scholars from private schools, classes of young men and also by a considerable number of the school children of Leeds, who have visited the Museum to make a detailed study of the objects, both before and after attending the Museum Lectures.

An excellent use is now being made of the contents of the Museum. On the suggestion of the Leeds and District Association of the National Union of Teachers, the sanction of your Council has been given to a scheme by which nearly half the children in the higher standards of the Public Elementary Schools of Leeds are brought to the Museum in weekly batches of about 350, under the charge of teachers and a supervisor. A lecture, illustrated by lantern slides of objects in the collections, is given by the Curator in the Lecture Theatre, each child being provided with a printed syllabus, giving an outline of the lecture, and a list of those objects in the collections to which attention should be chiefly directed. At the close of the lecture, the children are taken in sections round the Museum by their teachers, who explain the objects. The children change from room to room under the charge of their teachers, when the bell of the supervisor is rung.

The children, after visiting the Museum, are required to write essays, and judging from specimens which have been sent to the Curator, some well illustrated by sketches, there is gratifying evidence that the purpose of the visit to the Museum is being fulfilled.

Up to the present 6,197 children and 197 teachers from 127 Board, Church and Roman Catholic Schools of Leeds, and 26 pupil teachers with their master, from the Pudsey Board School have attended. Applications have been made from schools outside the Scheme to attend, and these the Leeds Association of Teachers is arranging to meet.

A Special Lecture has been given to Teachers only, and a Saturday evening Lecture to Parents of the School Children.

The thanks of the Society are due to those Headmasters and Teachers who have so successfully carried out this very important Educational Scheme, by which the valuable collections in its Museum are made more widely known.

During the past year, Mr. Dodgson, who has so kindly undertaken to classify the Society's Collection of Coins, has continued his valuable work.

The Catalogue of Roman Republican Coins has been revised, and a check catalogue has also been made to facilitate references to Babelon's "*Monnaies de la République Romaine*." Babelon has arranged them under nine periods, which show the chronological order in which he supposes they were issued. This catalogue describes 308 coins, of which three are gold, 272 silver, 9 bronze, the latter belonging to the coinage of Italian Cities, and 24 Ases and divisions of the As, issued by Rome. Each coin is numbered, and the catalogue type-written.

The Roman Imperial first brass coins, of which the Society possesses 120, have been arranged and numbered.

The Greek coins, numbering 233, have been catalogued. The arrangement of these coins is Geographical, and is that given by Head in his "*Historia Numorum*." With few exceptions

the coins have been identified and catalogued with check references to facilitate their inspection. The Greek coins include those of Parthia, of which the Society possesses 17, among them are coins of the Arsacidæ, who reigned from B.C. 250 to A.D. 230, followed by the Sassanidæ from 226—652 A.D. These have been identified by references to Gardener's "Parthian Coinage," and Rawlinson's "7th Monarchy." Four rare and interesting Indo-Scythic coins have been identified as belonging to what are now known as the North-West Provinces of India, and were issued during the first century of our Era. Two belong to an unknown King, whose coins, inscribed Megas Soter, are thought to date from 30—50 A.D., and are usually found in the Kabul Valley. Two belong to Kadphises II., a Scythic King, a founder of a powerful line of Kings, and the first to combine the whole of the North-Western Provinces and the Kabul Valley under one government.

The Catalogues already made and type-written are—

	Coins.
1st.—Bronze Coins of Italian Cities	9
The As and its divisions	21
2nd.—The Republican Silver, alphabetically arranged ...	272
3rd.—The Republican Silver, chronologically arranged in nine periods according to Babelon	
4th.—The Imperial Silver Coins, chronologically arranged ; half of these type-written	434
5th.—Roman Gold Coins, Republican, Imperial, and Byzantine	138
6th.—Greek Coins, including Parthian and Indo-Scythic...	233
7th.—An analytical Catalogue of the Greek Coins, showing the cities in Europe, Asia, and Africa where they were struck, and in what metals.	

An extra installation of electric lighting has been made in the Lecture Theatre, by the addition of six 3-lamp clusters, giving an additional lighting equal to about three hundred candle power; an improvement much appreciated by the Musical Societies which use the Hall.

A type-writing machine has been purchased for the printing of Museum labels.

Many improvements have been made in the Museum in the re-arrangement of objects, repainting of cases and the replacing of shelves of wood by others of glass. The result, as may be seen on the Staircase, where an extra light has been introduced by means of glass at the top of the cases is such as to encourage a further extension of this principle of lighting.

In the Bird Room a case has been arranged to allow of a better display of the very valuable collection of Dodo bones, found in the draining of a morass, in Mauritius in 1865, and presented to the Society by Mr. H. P. Higginson. Valuable help has been given by Miss Sikes, Almondbury, Huddersfield, who has kindly made two water-color drawings from Roland Savery's pictures of the Dodo, made in 1626 and 1628, and several ink sketches of old drawings of this extinct bird. It is felt that this display will make the Society's collection of remains of this bird more intelligible.

A case has been set up in the North Geological Room containing the fine specimen of Stem of *Cordaite* (*Cordaioxylon* sp.) from the Middle Coal Measures, Barnsley, presented last year to the Society by Mr. Walter Hemingway, of Barnsley.

A re-arrangement has been made of the Egyptian and Peruvian objects in the Inner Vestibule, which has allowed of the display in separate cases of the several collections presented by Mr. Bendelack Hewetson, Prof. Petrie, the Egypt Exploration Fund, and that long in the possession of the Society. Mr. Dodgson has kindly lent a series of Egyptian objects which has been arranged in one of the cases.

The donations to the Museum are of considerable value and interest. A series of rare and fine specimens of Yorkshire Coal-plant Fossils, collected by the donor, has been presented by Mr. Walter Hemingway, of Barnsley.

The Hon. W. A. B. Gellibrand, a Member of the Tasmanian Legislature, and an Hon. Member of the Society, has presented a fine series of Gold, Silver, Copper, and Tin specimens from Mount Lyell, Tasmania, of considerable value, as they represent the characteristic minerals found in Tasmanian Mines.

To make more complete the Society's collection of Roman Republican bronze coins, Mr. William Howgate, a Member of the Society, has presented a quadrans and a sextans, two divisional coins of the Roman As.

The Egypt Exploration Fund has generously presented, through the kindly interest of Mr. David Randall-MacIver and Miss Paterson, the Secretary, a collection of eighty objects from Mr. MacIver's excavations of 1901, at El Amrah, six miles south of Abydos. The objects include prehistoric slabs of slate, on which the malachite pigment, used for painting around the eyes of ladies, was ground, and the pebbles used in the grinding, alabaster Kohl-pots, XII. to XV. Dynasty, and a large and most interesting series of predynastic terra-cotta vessels. Of the latter we have five kinds: (1) Black-topped Pottery—made, as are all these prehistoric vessels, without the aid of a wheel, and composed of Nile mud with a little of the Nile sand-bank. The body of the vessel has burned red, but where it rested mouth downwards in the ashes of a fire, a depth of about two inches, the wash or coating of hæmatite or ochre has burned black. (2) Polished Pottery—burnished red vessels burned above the fire. (3) Wavy-handled Pottery of several forms and ages, the body of these has burned hard and drab, and the vessels are supposed to have been used for storing oil. (4) Decorated Pottery, on which are dull ornamental red lines, and (5) Rough-faced Pottery—drab coloured vessels common in graves, and often found full of ashes and burnt earth.

Mr. H. Kremnitz, has presented a small collection of Butterflies and Beetles, which were formerly in the collection of

his grandfather, the late Mr. Joshua Buckton, whose brother, the late Mr. Wm. Frederick Buckton's valuable cabinet of British Lepidoptera is already in the possession of the Society.

Mr. James Bedford, a Member of the Society, has presented a male specimen of the Golden Pheasant, which has been set up at the donor's expense for comparative display, in the Pheasant case in the Bird Room.

A finely set up specimen of the Blue Plantain-Eater and of the Australian Black Swan have been given by Mr. Alfred White, F.Z.S., a subscriber to the Society. The Swan is one of a pair which were formerly in the Canal Gardens, Roundhay.

Mr. H. W. Seton-Karr has kindly presented six Palæolithic Implements of chert, quartzite and chalcedonic sandstone collected by the donor at Jalelo, Somaliland, East Africa.

From Mr. James E. Bedford, F.G.S., a Member of the Council of the Society, a valuable acquisition of objects has been received, which includes portions of antlers of Red Deer, dug up from a depth of 12 feet in the Airedale river-gravels in Kirkstall Road, Leeds; slabs of Sandstone, displaying Worm tracks; fragments of Pottery from the Kitchen Middens of Kilnsea; two New Zealand stone celts; and twenty-four Ethnological Implements, collected by Mr. Henry D. Bedford in New Guinea, which include stone and shell adzes, a *gabagoob*, or club with quoit-like stone knob, and other objects.

Mr. J. E. Hindle, Headingley, has presented a fine example of a fox, mounted on a ledge of rock-work watching a rabbit.

The thanks of the Society are due to the above-named gentlemen for their valuable gifts.

By the death of The Right Hon. Earl Fitzwilliam, K.G., the Society has lost its oldest Hon. Member, and a donor to the Museum. The late Earl was elected an Honorary Member of the Society in 1840.

*Summary of Meteorological Observations taken at the Philosophical Hall,
and at Lawnswood, during the year 1901.*

1900.	Mean Height of Barometer (inches).	Mean Temperature of Air (degrees).	Amount of Rainfall.	
			Museum (inches).	Lawnswood (inches).
January	29·77	38·3	1·29	1·62
February	29·84	37·4	1·11	1·48
March	29·56	40·1	1·63	2·00
April	29·58	48·0	1·90	2·59
May	29·89	54·5	1·14	1·08
June	29·80	58·1	·87	·95
July	29·79	66·7	·95	1·14
August	29·78	62·4	1·30	1·37
September	29·67	57·8	·93	1·16
October	29·65	50·4	1·63	1·90
November	29·90	42·5	3·25	4·10
December	29·37	39·0	4·42	3·41
Yearly Means ...	29·72	49·6	20·42	22·80

EXTREMES FOR THE YEAR.

Greatest Barometric pressure—30·45 inches on January 23rd, February 15th, March 23rd, and November 24th, the Temperature of the Mercury being 51°, 40°, 46°, and 41° F.; Least pressure—28·55 on December 25th, the Temperature of the Mercury being 41°.

Greatest degree of Heat, indicated by the Thermometer in the shade—89° on July 18th; Minimum—23° on December 22nd.

Greatest fall of Rain (during 24 hours)—1·37 inches on November 11th. Average yearly Rainfall at the Museum for the ten years 1892—1901, 25·48 inches.

RELATIVE SUNSHINE AT THE URBAN AND RURAL STATIONS,
THE MUSEUM AND ADEL.

Deficiency of Museum from Adel:—

1889-90	33·4 per cent.	1897-98	18·7 per cent.
1891-92	30·5 „	1899-1900	19·6 „
1893-94	20·0 „	1901	14·5 „
1895-96	19·3 „		

The adopted Mean Temperature of the Air is the mean of the following four daily readings:—(a. and b.) Dry Bulb Thermometer read at 10 a.m. and 4 p.m.; (c. and d.) Maximum and Minimum Thermometers, all the instruments in a screen.

The Hall is situated at 1° 32' 45" W., and 53° 47' 51" N.

The Bench Mark at the corner of the Philosophical Hall is 131·8 feet above sea level, and 10 inches above the pavement. The Cistern of the Barometer is 12·8 feet, the Thermometers are 42 feet, and the Rain-gauge is 45 feet above the Bench Mark.

SUNSHINE AT LEEDS IN 1901.

The observations recorded below were made by Jordan's Photographic Sunshine Recorder at the following stations in Leeds:—

1. The Museum of the Philosophical and Literary Society, situate in the centre of the city; elevation above the sea, 145 feet. Recorder—Mr. H. CROWTHER, Curator.
2. Woodhouse Cliff, $1\frac{1}{2}$ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb. Recorder—Mr. GIBSON, Cliff Lodge.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the city. Recorder—Mr. S. R. DYSON.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible Duration.
JANUARY	1	25'10	10'4
	2	24'50	10'2
	3	31'40	13'1
FEBRUARY	1	58'40	21'9
	2	66'00	22'4
	3	67'40	25'3
MARCH	1	103'40	28'4
	2	128'10	35'2
	3	140'50	38'7
APRIL	1	189'00	45'2
	2	213'30	51'0
	3	229'30	54'9
MAY	1	218'30	44'4
	2	223'30	45'4
	3	239'10	48'6
JUNE	1	232'30	47'1
	2	253'50	50'1
	3	252'20	49'8
JULY	1	217'50	43'0
	2	242'50	48'0
	3	250'30	49'5
AUGUST	1	223'00	49'0
	2	225'20	49'5
	3	237'10	52'1
SEPTEMBER	1	120'00	32'0
	2	128'30	34'3
	3	133'10	35'6
OCTOBER	1	79'40	24'8
	2	93'20	29'1
	3	104'30	32'6
NOVEMBER	1	32'00	12'8
	2	49'50	20'0
	3	51'10	20'5
DECEMBER	1	20'30	9'2
	2	28'30	12'8
	3	39'30	17'7

SUMMARY FOR THE YEAR.

Hours recorded.		Difference from mean of ten years in hours.		Percentage of possible duration.	
	H. M.		H. M.		
Museum ..	1,520 40	..	+394 27	..	34'4
Woodhouse Cliff ..	1,678 10	..	+271 36	..	38'0
Lawnswood ..	1,777 10	..	+249 24	..	40'2
37'5 per cent. mean for 1901.			26'5 per cent. mean for 1896.		
30'7	1900.		37'5		1895.
32'1	1899.		29'0		1894.
27'8	1898.		31'6		1893.
31'4	1897.		27'5		1892.
or 31'1 per cent. mean for ten years.					

The Meteorological Office publishes the following Records of Sunshine for 1901, as observed at stations taken as representing specified districts:—

Stations.	Number of Hours.	Difference from mean, hours.	Percentage of possible duration.
Scotland, N. (Stornoway, &c.)	1,270	+152	29
„ E. (Aberdeen, Marchmont)	1,459	+163	33
„ W. (Glasgow; Douglas, Isle of Man)	1,532	+190	35
England, N.E. (Durham, York)	1,539	+241	35
„ N.W. (Stonyhurst, Blackpool, Llandudno)	1,683	+287	38
„ Mid. (Cirencester, Oxford, &c.)	1,487	+145	35
„ S. (London, Hastings, Southampton, &c.)	1,870	+200	42
„ E. (Hillington, Geldestone, Cambridge)	1,821	+171	39
„ S.W. (Pembroke, Falmouth, Plymouth, &c.)	1,728	+69	40
Ireland, N. (Armagh, Markree Castle)	1,359	+94	31
„ S. (Dublin, Parsonstown, Valentia)	1,484	+36	34
Channel Islands (Jersey)	1,924	+35	44

SUMMARY.

43'4 per cent. mean for United Kingdom, 1901.	31'8 per cent. mean for United Kingdom, 1896.
39'6	33'8
36'6	31'1
33'5	37'0
34'1	35'2
or 35'2 per cent. mean for ten years.	

LIST OF PRESIDENTS

SINCE

THE FOUNDATION OF THE SOCIETY.

1821—5.	JOHN MARSHALL.
1826 & 7.	Rev. W. H. BATHURST, M.A.
1828—30.	MICHAEL THOS. SADLER, M.P.
1831 & 2.	WILLIAM HEY.
1833 & 4.	JAMES WILLIAMSON, M.D.
1835 & 6.	Rev. JOSEPH HOLMES, M.A.
1837—9.	Rev. RICHARD WINTER HAMILTON.
1840 & 1.	ADAM HUNTER, M.D.
1842—4.	JOHN HOPE SHAW.
1845—50.	Rev. WILLIAM SINCLAIR, M.A.
1851.	WILLIAM WEST, F.R.S.
1852 & 3.	Rev. CHARLES WICKSTEED, B.D.
1854—6.	JOHN HOPE SHAW.
1857.	JAMES GARTH MARSHALL, F.G.S.
1858.	Rev. W. F. HOOK, D.D.
1859 & 60.	Rev. ALFRED BARRY, M.A.
1861 & 2.	THOS. PRIDGIN TEALE, F.R.S.
1863—5.	Rev. THOS. HINCKS, B.A.
1866 & 7.	CHARLES CHADWICK, M.D.
1868—71.	JOHN DEAKIN HEATON, M.D.
1872 & 3.	Rev. CANON WOODFORD, D.D.
1874 & 5.	J. I. IKIN, F.R.C.S.
1876 & 7.	Rev. J. H. MCCHEANE, M.A.
1878—80.	T. CLIFFORD ALLBUTT, M.D., F.L.S.
1881 & 2.	Rev. JOHN GOTT, D.D.
1883 & 4.	J. E. EDDISON, M.D.
1885.	EDWARD ATKINSON, F.L.S.
1886—8.	THOMAS MARSHALL, M.A.
1889—91.	THOS. PRIDGIN TEALE, M.A., F.R.S.
1892 & 3.	Rev. J. H. D. MATTHEWS, M.A.
1894 & 5.	Rev. CHARLES HARGROVE, M.A.
1896 & 7.	EDMUND WILSON.
1898 & 9.	NATHAN BODINGTON, M.A., Litt.D.
1900 & 01.	J. H. WICKSTEED, M.Inst.C.E.
1902.	ARTHUR SMITHELLS, B.Sc., F.R.S.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Payments for the year ending 30th April, 1902.

RECEIPTS.			DISBURSEMENTS.		
	£	s. d.		£	s. d.
To Balance in hand, May 1st, 1901 ...	...	33 1 0	By Repairs and Alterations...	...	...
" Annual Subscriptions, viz.:—			" Taxes ...	27 15 5	62 11 9
66 New Proprietary Members ...	69 6 0		" Fire Insurance ...	12 10 0	
2 Ordinary " ...	4 4 0		" Coke and Coal ...	20 12 1	
53 New Ordinary " ...	55 13 0		" Gas and Water ...	24 7 10	
86 Annual Subscribers, of 21s. ...	90 6 0		" Cleaning ...	8 3 5	
72 Annual Subscribers, of 7s. 6d. ...	27 0 0		" Furniture and Fixtures ...	...	93 8 9
Arrears	7 1 0	253 10 0	" Salaries and Wages ...	269 9 0	45 11 8
Rent, viz.:—			" Collector ...	11 13 3	
Lecture Room and Library	...	...	" Auditors ...	2 2 0	
Cellars	239 2 6		" Collections and Library...	...	283 4 3
Visitors to Museum...	50 0 0	289 2 6	" Postages ...	11 1 1	44 17 0
" Sale of Guides ...	...	99 17 10	" Advertising and Printing	...	
" Sundries	4 2 1		" Lectures ..	32 4 5	
" Midland Railway Dividend	2 4 0		" Telephone Co. ...	96 17 5	
" Sale of Forfeited Share ...	...	6 6 1	" Sundries ..	10 0 0	
		53 11 2	" Electric Lighting...	13 10 7	163 13 6
		5 5 0	" Balance—Cash in hand ...	...	18 6 7
			" " " Bank ...	5 10 4	
			" " " " "	23 9 9	29 0 1
					<u>£740 13 7</u>

We have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.

LEEDS, May 6th, 1902.

BEEVERS & ADGIE,
CHARTERED ACCOUNTANTS.

Capital Account.

£2,270 Preference 2½ per cent. Midland Railway Stock.

LIST OF DONATIONS AND ADDITIONS

TO THE

SOCIETY'S MUSEUM AND LIBRARY.

1901-1902.

*Those marked thus * are Honorary Members ; thus † Members or Subscribers of the Society.*

ZOOLOGY.

Mounted Specimen of male Golden Pheasant (<i>Chrysolophus pictus</i>)	†Mr. James Bedford, Cliff Road, Hyde Park.
Landrail (<i>Crex pratensis</i>) in flesh	Mr. Fred. Wright, Leeds.
Stuffed Specimen of Australian Black Swan (<i>Cygnus atratus</i>)	†Mr. Alfred White, F.Z.S.
Mounted Specimen of the Blue Plantain-Eater (<i>Schizorhis gigantea</i>) ...	
Small Collection of Butterflies and Beetles	Mr. H. Kremnitz, Leeds.
Landrail in flesh, from Adel	†Dr. Eddison, Adel.
Fox mounted in a case	Mr. J. E. Hindle, Headingley.

GEOLOGY.

<i>Cordaites principalis</i> , <i>Lepidostrobus olryi</i> , <i>Astrothea Miltoni</i> , <i>Lepidophloios acerosus</i> , <i>Lepidodendron wortheni</i> , and other fossils from the Middle Coal Measures of Barnsley.	Mr. Walter Hemingway, Barnsley.
A small series of Fossils	
Coal-period plant root (<i>Stigmaria</i>), from excavations 20 feet deep in Briggate, opposite Commercial Street, Leeds	Mr. G. W. Boston, Boar Lane.
Coal-period plant roots (<i>Stigmaria</i>), from Meltham	
	Mr. Fk. Sykes, Leeds.

- Slab of Fossil Brachiopoda from quarry } Mr. Thomas Benton, Rich-
between Ripley and Pateley Bridge, } mond Road, Headingley.
- Several specimens of Oolitic Fossils } †Mr. E. Hawkesworth,
from the Coral Rag of Ayton } Crossgates.
- Portions of the Antlers of Red Deer }
dug up from a depth of 12 feet in the }
Airedale river gravels, Kirkstall } †Mr. James E. Bedford,
Road } F.G.S., Headingley.
- Two slabs of Sandstone showing Worm }
tracks }

MINERALOGY.

- A very valuable representative and }
selected Collection of Tasmanian }
Minerals, intended to show the } *The Hon. W. A. B. Gelli-
occurrence of gold, silver, lead, tin, } brand, Cleveland, Ouse,
copper, and other ores in the Mount } Tasmania.
Lyell Mines, Tasmania }
- Riebeckite-Eurite, Ailsa Crag, and } Mr. Walter Hemingway,
Tremolite, Lendelfoot, Ayrshire ... } Barnsley.
- Specimen of pure Copper and Copper }
oxide in Talc, Copper Mountain } Mr. James W. Betteridge,
Mine, Box Elder County, Utah..... } Utah, U.S.A.

ETHNOLOGY.

- A series of objects collected by Mr. }
Henry D. Bedford, in New Guinea, }
comprising adze handles decorated }
with native carvings, two shell adzes, } †Mr. James E. Bedford,
two stone adzes, a *gabagoob*, or, } F.G.S., Headingley.
quoit-like stone club, eleven wooden }
spears, and other objects }

ARCHÆOLOGY.

- Six Palæolithic Stone Implements } By the Collector, Mr. H.
from Jalelo, Somaliland, East Africa. } W. Seton-Karr.
- Prehistoric objects from the excava- }
tions at El Amrah, in Upper Egypt, }
1901 :—Consisting of a large series }
of pottery of several forms of the }
XVIII. Dynasty; Kohl pots in }
alabaster, XII. to XV. Dynasty, and } The Egypt Exploration
Slate-palettes, on which malachite } Fund, per Mr. D. Randall
was ground, and the pebbles used } Mac-Iver, and Miss Pater-
in grinding the pigment..... } son.

- Two polished stone Celts, collected in }
 New Zealand by Mr. Cousins in 1889 } †Mr. J. E. Bedford, F.G.S.,
 Fragments of Pottery, from Kitchen- } Headingley.
 midden deposit, Kilnsea, Spurn Point }

NUMISMATICS.

- A Quadrans and a Sextans ; two coins }
 of the Roman Republic, Circa B.C. } †Mr. W. Howgate, Leeds.
 330-280..... }

DRAWINGS & PHOTOGRAPHS.

- Two water-colour drawings and pen } Miss Sikes, Almondbury,
 and ink sketches of the Dodo } Huddersfield.
 Colored illustration of the Okapi { †Mr. Ed. Atkinson, F.L.S.,
 Harrogate.
 Photographs of New Zealand Scenery. { †Mr. James E. Bedford,
 F.G.S., Headingley.
 Illustrations of Zebras †Mr. W. Howgate, Leeds.

MISCELLANEOUS.

- One-pound Selby Bank Note { Mr. J. Thackray, Jack Lane
 Leeds.
 Short length of a "Possible Chain." { Mr. W. E. Garforth, C.E.,
 Snydale Hall, nr. Pontefract.
 Two specimens of decomposed Glass }
 showing formation of microlithes } †Mr. James E. Bedford,
 and spherulites } F.G.S., Headingley.

PUBLICATIONS.

- Catalogue of Physiological Series, in }
 the Museum of the Royal College } The Council of the Royal
 of Surgeons of England. Second } College of Surgeons.
 edition, Vol. I..... }
- Catalogue of Lepidoptera Phalaena, }
 Vol. III. }
 Catalogue of Welwitsch's African } The Trustees of the British
 Plants, Vol. II., Part II..... } Museum.
 Hand-list of Birds, Vol. III..... }
 Catalogue of Fossil Fishes, Part IV. }

Domesday Book for the County of Dorset, with a translation by the Rev. William Bawdwen, M.A.	} Mr. Joseph Moreton, Leeds.
Historia Numorum; a Manual of Greek Numismatics, by Barclay V. Head...	
Monnaies de la République Romaine par Ernest Babelon.....	} Purchased.
The International Numismata Orientalia, "The Parthian Coinage," by Percy Gardner, M.A.	
A Handbook of Greek and Roman Coins, by G. F. Hill, M.A.	

PERIODICALS.

WEEKLY.

Nature	Purchased.
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MONTHLY.

Annals and Magazine of Natural History.....	} Purchased.
Geological Magazine	
Journal of the Chemical Society	Purchased.
Monthly Notices of the Royal Astronomical Society	} The Society.
Philosophical Magazine and Journal of Science	
	Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical Society	} The Society.

QUARTERLY.

Quarterly Journal of Microscopical Science	} Purchased.
Quarterly Journal of Geological Society	
Quarterly Returns of Marriages, Births, and Deaths.....	} Registrar-General.
Zeitschrift für Wissenschaftliche Zoologie	
	Purchased.
Journal of the Linnean Society	} Mr. Edward Atkinson, F.L.S.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions.....	Purchased.
Proceedings of the Royal Society ...	The Society.
Proceedings of the Royal Institution } of Great Britain	The Institution.
Publications of the Ray Society	Purchased.
Fauna Gaskohle	Purchased.
Abridgments of Specifications for } Patents	The Comptroller - General of Patents.
British Association Report.....	The Association.
Greenwich Observations.....	The Astronomer-Royal.
Memoirs of the Royal Astronomical } Society	The Society.
Radcliffe Astronomical and Meteor- } ological Observations	Radcliffe Trustees.
Symons's British Rainfall	Purchased.
Monograph of the Palæontographical } Society	Purchased.
Proceedings of the Yorkshire Geological } and Polytechnic Society.....	The Society.
Transactions of the Leeds Naturalists' } Club and Scientific Association.....	The Association.
Transactions of the Leeds Geological } Association	The Association.
Transactions of the Leeds Astronomi- } cal Society	The Society.
Proceedings of the Liverpool Geo- } logical Society.....	The Society.
Journal of the Liverpool Geological } Association	The Association.
Natural History Transactions of } Northumberland, Durham, and } Newcastle-upon-Tyne.....	The Tyneside Naturalists' Field Club.
Proceedings of the Birmingham Philo- } sophical Society	The Society.
Annual Report of the Yorkshire } Philosophical Society	The Society.

Transactions of the Leicester Literary and Philosophical Society	} The Society.
Report of the Committee of Leicester Town Museum	} The Museum.
Report of the Royal Institution, Hull	The Institution.
Report of the Meteorological Depart- ment of the Borough of Southport.	} The Meteorological Ob- server.
Report of the Bristol Museum	The Museum Committee.
Report of the Reading Museum	{ The Free Library and Museum Committee.
Annual Report of the Brighton Town Museum	} The Museum.
Annual Report, Middlesex Hospital...	The Hospital.
Annual Report of the Birkenhead Literary and Scientific Society	} The Society.
Proceedings of the Liverpool Literary and Philosophical Society	} The Society.
Annual Report and Proceedings of the Liverpool Science Students' Association	} The Association.
Memoirs and Proceedings of the Man- chester Literary and Philosophical Society	} The Society.
Transactions of the Manchester Geo- logical Society	} The Society.
Reports of the Manchester Museum Handbooks do. do.	} The Keeper.
Annual Report of the Sheffield Literary and Philosophical Society	} The Society.
Annual Report of the Chester Society of Natural Science and Literature	} The Society.
Journal of the Royal Institution of Cornwall	} The Institution.
Annual Report of the Royal Cornwall Polytechnic Society.....	} The Society.
Report of Associated Architectural Societies	} The Association.
Journal of the Chester Archæological and Historic Society	} The Society.

Geological Record	Purchased.
Transactions of the Yorkshire Naturalists' Union ..	} The Union.
Proceedings of the Royal Society of Edinburgh	
Transactions do. do.	} The Society.
Transactions of the Edinburgh Geological Society.....	
Proceedings of the Glasgow Philosophical Society	} The Society.
Proceedings of the Berwickshire Naturalists' Club	
Scientific Proceedings of the Royal Dublin Society.....	} The Society.
Scientific Transactions do.	
Transactions of the Royal Irish Academy	} The Academy.
Proceedings do. do.	
Journal of the Royal Geological Society of Ireland	} The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club	
Publications of the Royal Swedish Academy of Sciences.....	} The Academy.
Papers of the Royal University of Norway	
Bulletin of the Geological Institution of the University of Upsala	} The Institution.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhandling.....	
Bulletin, Société Impériale, Moscow...	} The Society.
"Leopoldina" Amtliches organ der Kaiserlichen, Leopoldino-Carolinischen Deutschen Akademie der Naturforscher	
Mittheilungen der Kais. Königl. Geographischen Gesellschaft in Wien ...	} The Society.
Memoirs of the National Academy of Sciences	
	} The Academy.

Report of Australasian Association for the Advancement of Science.....	} The Association.
Journal and Proceedings of the Royal Society of New South Wales	} The Society.
Journal of the Royal Geographical Society of Australasia	} The Society.
Wealth and Progress of New South Wales	} The Agent-General.
Records of the Geological Survey of New South Wales	} The Surveyor.
Memoirs of the Geological Survey of New South Wales	
Annual Report and Papers of the Department of Mines and Agricul- ture, New South Wales	} The Department.
Prodromus of the Zoology of Victoria	The Editor.
Records of the Australian Museum	} The Trustees.
Report of the Trustees of the Austra- lian Museum.....	
Proceedings of the Royal Society of Queensland	} The Society.
Queensland Agricultural Journal	The Society.
Annals of the Queensland Museum...	The Trustees.
Guide to Queensland	The Government.
Transactions and Proceedings of the New Zealand Institute	} The Institute.
Papers and Proceedings of the Royal Society of Tasmania	
Proceedings and Transactions of the Royal Society of Canada	} The Society.
Proceedings of the Canadian Institute	} The Institute.
Annual Report do.	
Transactions do.	
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	} The Institute.
Annual Report, Hamilton Public Library, Ontario, Canada	} The Librarian.
Journal and Proceedings of the Hamil- ton Association	} The Association.

Geological and Natural History Survey of Canada	} Department of the Interior.
Annual Report and Papers—do.	
Contributions to Canadian Palæontology	
Bulletin of the Natural History Society of New Brunswick.....	} The Society.
Memorias de la Sociedad Científica (Mexico)	
“ Boletin Mensual ” Observatorio Meteorologico-Magnetico Central de Mexico	} The Editor.
Annuario del Observations Astrón- omico Nacional Mexico.....	
Boletin del Observatorio Astronómico Nacional de Tacubaya	} The Observer.
Report of the Museum National, Rio-de-Janeiro.....	
Archivos do.	} Directeur-Général.
Cape Meridian Observations	
Report of H.M. Astronomer at the Cape of Good Hope to the Secretary of Admiralty	} Cape Astronomer-Royal.
Transactions of the American Philo- sophical Society	
Proceedings do.	} The Society.
United States Geological Survey, Annual Report.....	
Contributions to American Ethnology.	} The Department.
United States Geographical and Geo- logical Survey	
United States Department of Agricul- ture, Publications of	} The Department.
Report of the Smithsonian Institution Smithsonian Miscellaneous Collections Smithsonian Contributions	
Annual Reports of the Bureau of Ethnology	} The Institution.
Miscellaneous Publications of the Bureau of Ethnology	

Proceedings of United States National Museum	}	The Museum.
Report do. do.		
Bulletins do. do.		
Transactions of the Academy of Science of St. Louis	}	The Academy.
Proceedings of the Academy of Natural Sciences of Philadelphia...		
Papers do. do.	}	The Academy.
Transactions of the Wagner Institute of Science, Philadelphia.....		
Proceedings of the American Academy of Arts and Sciences.....	}	The Academy.
Transactions of the Botanical Society of America		
Botanical Society of America	Society, Cornell University.	
Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	}	The Academy.
Bulletins of the Wisconsin Geological and Natural History Society..		
Memoirs of the National Academy of Sciences, Washington.....	}	The Academy
Bulletins of the Philosophical Society of Washington.....		
Proceedings of the Davenport Acad- emy of Natural Science.....	}	The Academy.
Transactions of the Wagner Free Institute of Science, Philadelphia ...		
Annual Report, Transactions, and Mis- cellaneous Papers of the Historical and Scientific Society of Manitoba	}	The Society.
Annual Report of the Trustees of the Cooper Union for the Advancement of Science		
Proceedings of the Boston Society of Natural History, U.S.A.	}	The Society.
Memoirs do.		
Bulletins of the Essex Institute, U.S.A.	The Institute.	

Annual Report of the Curator of the Museum of Comparative Anatomy, Harvard College	} The College.
Annual Report of Harvard College	
Harvard University Catalogue	The University.
Annual Report of the Chicago Academy of Sciences	} The Academy.
Transactions of the Astronomical Observatory of Yale University ...	
Annual Report do.	} The University.
Report of the President of Yale University	
Catalogue do. do.	
Journal of the Elisha Mitchell Scientific Society	
Tufts College Studies	The College.
Transactions of the Meriden Scientific Association	} The Association.
Bulletins of the Buffalo Society of Natural Sciences.. ..	
Bulletins of the University of Montana, Missoula	} The University.

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 31 Wilson, Richard . Westfield, Armley.
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 53 Hudson, Robert . Weetwood Mount, Far Head-
 ingley.
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 96 *Jepson, Edward George .
 40 Joy, William Lomas .
 43 *Kitson, James .
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 90 Lawson, Frederick W. . Oaklands, Adel.
 50 Leather, Ernest Arthur .
 95 Lupton, Arthur Greenhow . Wellington Street.
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 99 Lupton, Hugh . The Acacias, Roundhay.
 55 Lupton, Mrs. John . Moorlands, Headingley.
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 33 Muir, James .
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 30 Nicholson, Marshall . Middleton Hall, near Leeds.
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 67 Nunneley, A. G. .
 68 Oxley, James Walker . Spenfield, Weetwood.
 93 Palmer, Henry John, J.P. . 55, Albion Street.
 28 *Passavant, P. W. .
 82 Pearson, John Thomas . The Hall, Melmerby, S.O.
 11 Pegler, Thos. Boyne . 3, Sholebroke Avenue, Leeds.
 38 *Ralph, John, M.A. .
 34 *Ransome, Prof. Cyril, M.A.
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35	Wood, Philip T.	.
113	Young, R. L., L.D.S. Eng.	3a, Hillary Place.

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 20 Eddison, Mrs. R. W. . 4, Beech Grove Terrace.
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- 70 Nelson, James Henry .
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- 51 *Nunneley, Thomas .
- 52 Nussey, George Henry . St. Ann's, Burley, near Leeds.
- 53 Nussey, Obadiah . Morley House, Headingley.
- 54 Nussey, Thomas . Bramley Grange, Thorner.
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- 17 Redmayne, John . Grove House, Grosvenor Road.
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- 73 Rowley, Walter, C.E. . Alder Hill, Meanwood.
- 68 *Smith, William Farrar .
- 76 Smithells, Prof. A., B.Sc.,
F.R.S. . Wood Royd, Ben Rhydding.
- 1 Stroud, Prof. W., D.Sc., M.A. . Rupert Lodge, Grove Road.
- 77 *Titley, Anthony .
- 79 Tottie, Mrs. J. W. (P) .

64	Tweeddale, John	. 12, South Parade.
82	Walker, H. B.	.
83	Ward, Edmund	. Cromer Hall, Mount Preston.
57	Ward, George, F.C.S.	. Buckingham Ter., Headingley.
3	Webb, William Henry	. Aire Street.
80	White, Ernest A.	. Blundell Street.
47	Whitmell, C. T., M.A., B.Sc.	. Invermay, Headingley.
85	Willson, J. J.	. Ballamona, Headingley.

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Boyce, Frank	. 7, Whitehorse Street.
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Nicholson, John Carr	. Moorfield House, Headingley.

Nixon, S. E.	. St. Chad's Hill, Far Headingley.
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Peate, Jonathan	. Guiseley.
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Phillips, John Henry	. Hazel House, Methley.
Phillips, Rev. J. F.	. Emmanuel Vicarage.
Powell, Miss	. Girls' High School, Leeds.
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Robinson, Edmund	. 42, Park Square.
Rogers, Prof. L. J., M.A., Mus.Bac.	. 13, Beech Grove Terrace.
Sanders, T. W.	. 5, Blenheim Square.
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Sykes, Arthur	. Roundhay Grange.
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Teale, Michael A.	. 5, Blenheim Terrace.
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Walker, H. Secker, F.R.C.S.	. 45, Park Square.
Walker, James, J.P.	. Newton Park.
Walker, George	. Do.
Ward, Edward, M.A., M.B.	. 22, Park Place.
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White, Alfred, F.Z.S.	. Oakwood Avenue, Roundhay.
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Wilkinson, William	. Ashton House, Hemingborough, E. Yorks.
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Barran, Miss Edith	. .	Do.
Barran, J. N., B.A.	. .	Do.
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Brunton, Miss	. .	Blenheim Terrace.
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Cameron, Mrs.	. .	Ridge Mount, Cliff Road.
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Crampton, Charles	. .	Do.
Cross, Mrs. J. R.	. .	Newlaithes Hall, Horsforth.
Croysdale, Mrs. J.	. .	Westfield, Chapel-Allerton.
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Foster, Mrs. George	. .	Castlestead, Boston Spa.
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Hannam, Mrs. W. S.	. .	4, East Parade.
Hellier, Mrs.	. .	1, De Grey Terrace.

Hepper, Miss M. E.	. Clareville, Headingley.
Holbrook, Mrs.	. St. Ann's Villas, Monkbridge Rd.
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THE
EIGHTY-THIRD REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1902-1903.

READ AT THE ANNUAL MEETING, MAY 5th, 1903.

LEEDS:
JOWETT & SOWRY, PRINTERS AND LITHOGRAPHERS, ALBION STREET.

1903

THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY consists of the following Classes of Members and Subscribers:—

- (1.) ORIGINAL PROPRIETARY MEMBERS (holding £100 Shares), who are entitled to personal admission to the Museum, Library, Lectures, and all other Meetings of the Society, and to two transferable tickets to admit visitors to the Lectures. They are exempt from Annual Subscription.
- (2.) NEW PROPRIETARY MEMBERS (holding £50 Shares), who are entitled to similar personal privileges, and to two transferable tickets. Subscription, £1 1s. per annum.
- (3.) ORIGINAL ORDINARY MEMBERS (holding £3 3s. Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £2 2s. per annum.
- (4.) NEW ORDINARY MEMBERS (holding £20 Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £1 1s. per annum.

The following are entitled to personal admission to the Museum, Library, and Lectures, but not to business meetings: nor have they any transferable tickets to admit visitors:—

- (5.) HONORARY MEMBERS, elected on the recommendation of the Council.
- (6.) SUBSCRIBERS of £1 1s. per annum.
- (7.) SUBSCRIBERS of 7s. 6d. per annum, being Ladies or Young Persons resident with Members, or with Subscribers in Class (6).

A list of shares offered for sale is kept in the office, and information as to price, &c., may be obtained from the Curator.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE END OF THE

EIGHTY-THIRD SESSION.

The thanks of the Society are due to the following gentlemen who have given lectures gratuitously during the past Session :—
Mr. E. Kitson Clark, Dr. Eddison, Prof. Gowland, Rev. Charles Hargrove, Mr. P. F. Kendall. There has been an increased attendance at the lectures during the last Session.

The full lecture list is as follows :—

- 1.—“The Aurora Borealis.” By Sir WILLIAM RAMSAY, K.C.B., LL.D.,
F.R.S. *Oct. 21st, 1902.*
- 2.—“On the Forms of Sand Hills and Snow Drifts.” By VAUGHAN
CORNISH, D.Sc., F.R.G.S. *Nov. 4th, 1902.*
- 3.—“Literature and Landscape Painting.” By ALFRED EAST, A.R.A.
Nov 18th, 1902.
- 4.—“Earthquakes and Volcanos, illustrated by recent disasters in the
West Indies.” By JOHN MILNE, F.R.S. *Dec. 2nd, 1902.*
- 5.—“Aristophanes and the Greek Choral Comedy.” By ARTHUR
SIDGWICK, M.A. *Dec. 16th, 1902.*
- 6.—“The Roman Wall from Newcastle to Carlisle.” By E. K. CLARK,
M.A., F.S.A. *Jan. 6th, 1903.*
- 7.—“Africa from South to North.” By Major A. ST. H. GIBBONS,
F.R.G.S. *Jan. 20th, 1903.*
- 8.—“What we owe to Pasteur.” By J. E. EDDISON, M.D. *Feb. 3rd,*
1903.
- 9.—“Ancient Glacier-Lakes in Yorkshire.” By P. F. KENDALL, F.G.S.
Feb. 17th, 1903.

- 10.—“About Crime and Criminals.” By Sir ROBERT ANDERSON, K.C.B.
 LL.D. *March 3rd, 1903.*
- 11.—“Gulliver’s Travels and its Author.” By Rev. CHARLES HARGROVE,
 M.A. *March 17th, 1903.*
- 12.—“Recent Discoveries at Stonehenge.” By WILLIAM GOWLAND,
 Vice-President of the Society of Antiquaries. *April 7th, 1903.*

The Members and Subscribers are comprised in the following classes:—

	1902.	1903.
Original Proprietary Members	63	63
New Proprietary Members	76	76
Ordinary Members	2	2
New Ordinary Members	54	54
Annual Subscribers of 21s.	93	100
Annual Subscribers of 7s. 6d.	76	73
	<hr/> 364	<hr/> 368

The Council regret that they have to record the death of three Members to whom the Society has been greatly indebted.

Mr. H. J. Palmer acted for some time as a Member of the Council, and contributed a valuable lecture to the Society on “Sydney Smith as a Yorkshire Parson.” Although his time was occupied by a very heavy burden of work, the Council on many occasions had the advantage of his special knowledge and thoughtful advice.

Mr. Edward Birchall was one of the most regular attenders at the lectures delivered in the Philosophical Hall, and lately had been persuaded to join the Council. In this capacity he greatly assisted in the important work of supervising the complete reorganisation of the drainage system.

In Mr. James Bedford the Society has lost a generous benefactor. Mr. Bedford for many years constantly attended the lectures, and showed his interest in the museum by gifts of considerable importance. In a later portion of this report a description is given of Mr. Bedford’s last donations, and the Council have had to thank him for many instances of his keen interest in the work of the Society.

Three Afternoon Lectures were given by the Curator during the Christmas Holidays on the following subjects:—"Savage Life in New Guinea," being a description of the Bedford collection of ethnological objects recently presented to the Museum; "The Story of a Fossil Fern," and "Butterflies and Moths." The large attendances indicate continued appreciation of these Christmas lectures.

At the request of the Council three additional lectures were given by the Curator on Wednesday evenings in February, on "Plants of the Hedgerows and the Woods," "The Beasts and Birds of the Country-side," and "Flying Insects and Crawling Snails." The lectures attracted audiences which filled the Hall, and they proved a great success.

In last year's Report the Council referred to the excellent use which was being made of the Society's Museum by weekly visits of groups of about 350 children from the Elementary Schools of Leeds. The proposal to use the collections in this way originated with the Teachers, and met with the warm approval of the Council. During the first year about 7,000 children visited the Museum. The experiment was so successful that arrangements were again made by the Leeds and District Association of the National Union of Teachers for a repetition of these lectures and visits.

At the present time a series of 30 lectures on "Marvels of Bird Life" is being given by the Curator. In connection with the course a syllabus has been prepared, and various objects illustrative of bird-life have been set out in the different rooms of the Museum for the children to examine. Since October over 10,000 children have visited the Museum.

It may be added that the scheme has received the warm approval of many inspectors and head-masters of schools, and has been adopted in other towns, and the thanks of the Society are due to the head-masters and teachers who have co-operated to make the visits of the children so satisfactory.

The Council take the present opportunity of expressing to Mr. Crowther, the Curator, their appreciation of the educational work to which he has devoted so much of his personal leisure, and which he has carried out with so much success.

Two special lectures on "Bird Life" have been given, the first to 247 teachers and scholars from Altofts Colliery and Church Schools; the second to 142 boys from the Leeds Church Middle Class School.

Besides these nearly 300 children have visited the Museum in small batches, in charge of teachers from the Leeds Schools, from Burley-in-Wharfedale, Ossett, and other places. These children were admitted at half-price.

The average number of Visitors to the Museum per annum for the last ten years is 24,238, the number of visitors who have paid full admission to the Museum during 1902-3 is 26,415, an increase of 2,441 over 1901-2.

Mr. Dodgson, the Hon. Librarian, who so kindly undertook to arrange and classify the coins in the Society's cabinets, has continued this laborious and valuable work.

During the year the following coins have been identified, arranged, catalogued, and ticketed:—

The Roman Imperial Bronze, comprising 275 Large, Middle, and Third Bronze coins, from those of Julius Cæsar 45 B.C. to Arcadius A.D. 395, followed by fifty-five Byzantine coins, extending from Arcadius to Constantine XIII., A.D. 1067. Eight Celtiberian coins of Spain, inscribed with Celtiberian characters and dating from 200 B.C., followed by the Alexandrian coins, in potin and bronze, during the Roman occupation of Egypt.

Mr. Dodgson has also dealt with the Ancient British coins, of which the Society owns five gold and sixteen silver and bronze examples, which are supposed (by Sir John Evans) to date from 150 to 200 B.C. Three of the bronze coins are from a hoard of one thousand found in Jersey in 1820. There are also two Sceattas of silver, the earliest Anglo Saxon coins, and

sixteen Stycas, small bronze coins of Northumberland, from a hoard of 2,000 stycas found at Hexham in 1813. Also thirty-six pennies in silver, issued under the so-called Heptarchy, by the sole Monarchs of England, and by the Archbishops, from the 8th to the 11th Centuries.

There have been ticketed and arranged about ninety of the pennies of the Norman, Plantagenet, and Lancasterian reigns, and those of the House of York, from A.D. 1066 to A.D. 1463.

The following coins have been identified, chronologically arranged, catalogued, and ticketed during the last year:—

BRONZE.

	Coins.
Roman Imperial First Brass, from Julius Cæsar, 45 B.C.	
to Postumus A.D. 267	120
Roman Imperial Second Brass	154
Celtiberian (Spain) 200 B.C.	8
Roman Imperial Third Brass	154
Alexandrine—under Roman rule—Potin	7
“ “ “ Bronze	16
Byzantine, Bronze	55

BRITISH SAXON AND EARLY ENGLISH.

British Gold Coins, 150 to 200 B.C.	5
Silver and Tin	17
Saxon, Sceattas, Silver	2
Pennies, “	27
Stycas, Bronze, Northumberland	16

EARLY ENGLISH.

Norman, William I. to Henry VII.	151
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732

The Trustees of the British Museum, on the recommendation of Dr. Murray, have presented to the Society a valuable series of about twenty Mycenaean objects, chiefly pottery, found during the British excavations in Cyprus.

The Pottery, of monochrome, of dull painted, or of lustrous ware, consists of vases, jugs, bowls, &c., representing probably three periods of Mycenaean art. Some of the objects are covered with a yellow "slip," on which are painted in red, figures of bulls, men, cuttlefishes, trees, flowers, spiral and other geometrical figures. Among the lustrous ware is a false-necked Mycenaean vase, the stopper of which is ornamented with rings of colour. There is an interesting example too of a vessel with incised linear ornament. A portion of a two-horned Hera idol is perforated with small holes for hanging.

Amongst other objects are spinning whorls in stone and terracotta, and disk-shaped ornaments of bone and stone, which are incised with scrolls and perforated, two pounders of basalt and part of a bronze spear socket.

The objects have been arranged in one of the cases for the display of Greek Pottery on the staircase landing.

Your Council feel that it is quite impossible to do justice in this Report to the valuable donation of Ethnological objects presented to the Society by the late Mr. James Bedford. These objects were collected in New Guinea, a few years ago, by his son, Mr. H. D. Bedford, when on a pearling expedition in the Torres Straits. A special case has been made for the display of the collection, which has been placed in the Inner Vestibule. The objects include articles of dress in shell, feather, grass, implements of warfare, shields, spears, clubs, drums, and domestic implements, adzes, lime bottles, pillows, nets, food dishes, &c.

Mr. A. Dodgson, Hon. Librarian, has kindly presented a number of ushabti figures, from the excavations at Abydos, in 1901, by the Egyptian Exploration Fund.

Mr. R. Wilson, Hon. Treasurer, has given a silver Jubilee Medal of Victoria, 1837-1887.

Mr. James E. Bedford, F.G.S., a member of Council, has given a series of framed photographs representing various geological features of Yorkshire; also a number of shoes of pack-horses

found during excavations in Burley Road, at a depth of thirteen feet, probably marking the spot of a former ford across a feeder of the Aire, now covered in, and carried under the road on the western side of the North Eastern Railway Bridge.

Mr. H. W. Seeton-Karr, who last year sent to the Museum several Palæolithic Implements from Somaliland, has kindly supplemented his gift by presenting a series of six quartzite Palæolithic Implements from the laterite deposits of Poondi, India.

Dr. West, of Morley, has presented a series of fossils from local Coal Measures, which conveniently fill some of the gaps in the present collection.

The Society owes its thanks to the Trustees of the British Museum, the Smithsonian Institution, and other bodies for volumes of the Reports, &c., also to Mr. John Clayton, Harrogate, who has presented the "History of the Cowthorpe Oak," fully illustrated by photographs, and to Dr. Tempest Anderson, for a copy of Philosophical Transactions of the Royal Society, containing reports on "The Eruptions of the Soufrière in St. Vincent, in 1902," and on "A Visit to Mont Pelée, in Martinique, Part I." Spink's "Numismatic Circular," 10 vols., has been acquired by purchase.

In March of last year, an interesting discovery of Roman Coins was made in Messrs. Pawson Bros. Quarry, at Thorpe-on-the-Hill, near Wakefield. The collection consists of nineteen silver and bronze coins which were struck under six successive Emperors from Vespasian A.D. 69 to Hadrian A.D. 138. The coins were kindly lent to the Society by their owner, Mr. Thomas Pawson, and were arranged in a case, and have since been exhibited in the Outer Vestibule.

The Zoological Collections have been enriched by the gift, by Mr. Thomas Barrasford, of specimens of the Chimpanzee and Drill, from Messrs. Barrasford and Bostock's Zoological Gardens, Glasgow. The specimens were mounted by Messrs. Lawrence and Co., Leeds, and are not only very fine examples of their kind, but are excellently set up.

Mrs. Braithwaite, Kirkstall Lane, Headingley, has generously presented the fine Collection of Foreign Shells made by her mother, Mrs. John Wade. The specimens are very beautiful, and amongst them are many forms not hitherto included in the Society's Collections.

Two fine unmounted skins of the Eagle and two mounted specimens of the Barn Owl have been presented by Mr. William Howgate, a Member of the Society.

In the Museum the lighting of several cases containing fossils has been improved, so that the specimens may now be more closely grouped, and fossils at present in other rooms brought under their proper classification. It is hoped that all the cases in one of the Geological Rooms will be rearranged during the coming year.

Many preparations and smaller cases illustrating "Bird Life" were arranged for the school children. The objects were made as attractive as possible, and divided among the different rooms in accordance with the scheme described in the previous Report.

The discovery of certain leakages in the drainage of the building has necessitated a very costly alteration of the whole drainage system, and this has been carried out under the supervision of the Corporation officials.

An extension of the electric lighting has been made in the Inner Vestibule, Cloak Rooms, and Curator's Room, and a temporary arrangement has been made to ascertain the most effective way of lighting the Outer Vestibule and cases.

The Hall was decorated on the occasion of the Coronation of the King.

*Summary of Meteorological Observations taken at the Philosophical Hall,
and at Lawnswood, during the year 1902.*

1902.	Mean Height of Barometer (inches).	Mean Temperature of Air (degrees).	Amount of Rainfall.	
			Museum (inches).	Lawnswood (inches).
January	29·834	42·2	1·00	1·14
February	29·682	36·0	1·16	1·87
March	29·544	44·5	·84	·90
April	29·731	46·7	1·69	1·50
May	29·773	47·9	2·60	2·90
June	29·782	56·9	1·74	2·26
July	29·803	57·9	1·74	2·32
August	29·730	57·5	3·48	3·87
September	29·839	55·4	·95	1·28
October	29·745	50·5	2·34	2·86
November	29·655	45·1	1·49	2·09
December	29·758	41·5	1·98	2·22
Yearly Means ...	29·739	48·5	21·01	24·21

EXTREMES FOR THE YEAR.

Greatest Barometric pressure—30·76 inches on January 31st, the Temperature of the Mercury being 41°; Least pressure—28·97, on January 28th, the Temperature of the Mercury being 41°.

Greatest degree of Heat, indicated by the Thermometer in the shade—86° on June 29th; Minimum—22° on February 12th.

Greatest fall of Rain (during 24 hours)—8·5 inches on August 27th. Average yearly Rainfall at the Museum for the ten years 1893—1902, 24·82 inches.

RELATIVE SUNSHINE AT THE URBAN AND RURAL STATIONS,
THE MUSEUM AND ADEL.

Deficiency of Museum from Adel:—

1889-90	33·4 per cent.	1897-98	18·7 per cent.
1891-92	30·5 „	1899-1900	19·6 „
1893-94	20·0 „	1901-1902	16·0 „
1895-96	19·3 „		

The adopted Mean Temperature of the Air is the mean of the following four daily readings:—(a. and b.) Dry Bulb Thermometer read at 10 a.m. and 4 p.m.; (c. and d.) Maximum and Minimum Thermometers, all the instruments in a screen.

The Hall is situated at 1° 32' 45" W., and 53° 47' 51" N.

The Bench Mark at the corner of the Philosophical Hall is 131·8 feet above sea level, and 10 inches above the pavement. The Cistern of the Barometer is 12·8 feet, the Thermometers are 42 feet, and the Rain-gauge is 45 feet above the Bench Mark.

SUNSHINE AT LEEDS IN 1902.

The observations recorded below were made by Jordan's Photographic Sunshine Recorder at the following stations in Leeds:—

1. The Museum of the Philosophical and Literary Society, situate in the centre of the city; elevation above the sea, 145 feet. Recorder—Mr. HENRY CROWTHER, Curator.
2. Woodhouse Cliff, 1½ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb. Recorder—Mr. W. GIBSON, Cliff Lodge.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the city. Recorder—Mr. S. R. DYSON.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible Duration.
JANUARY	1	29'40	12'3
	2	37'50	15'7
	3	45'50	19'0
FEBRUARY	1	37'50	14'1
	2	54'30	20'4
	3	60'00	22'4
MARCH	1	117'20	32'2
	2	119'00	32'6
	3	145'50	40'0
APRIL	1	193'10	46'2
	2	212'50	50'9
	3	228'50	54'7
MAY	1	179'30	36'4
	2	182'20	37'0
	3	201'50	41'0
JUNE	1	160'40	31'7
	2	169'50	33'5
	3	190'10	37'5
JULY	1	153'20	30'3
	2	170'20	33'6
	3	175'20	34'6
AUGUST	1	133'00	29'2
	2	148'40	32'6
	3	154'40	34'0
SEPTEMBER	1	127'50	34'1
	2	143'25	38'3
	3	149'30	39'9
OCTOBER	1	51'10	15'9
	2	60'40	19'0
	3	69'10	21'6
NOVEMBER	1	19'10	7'7
	2	25'00	10'0
	3	28'30	11'4
DECEMBER	1	0'50	0'3
	2	4'10	1'8
	3	10'50	4'8

SUMMARY FOR THE YEAR.

		Hours recorded.		Difference from mean of ten years in hours.		Percentage of possible duration.	
		H.	M.	H.	M.		
Museum		1,203	30	..	-45 09	..	27'27
Woodhouse Cliff		1,323	35	..	-86 34	..	30'10
Lawnswood		1,460	30	..	-72 00	..	33'09
30'1	per cent. mean for	1902.			31'4	per cent. mean for	1897.
37'5	" "	1901.			26'5	" "	1896.
30'7	" "	1900.			37'5	" "	1895.
32'1	" "	1899.			29'0	" "	1894.
27'8	" "	1898.			31'6	" "	1893.
or 31'0 per cent. mean for ten years.							

The Meteorological Office publishes the following Records of Sunshine for 1902, as observed at stations taken as representing specified districts:—

Stations.	Number of Hours.	Difference from mean, hours.	Percentage of possible duration.
Scotland, N. (Stornoway, &c.)	1,102	.. - 18	.. 25
.. E. (Aberdeen, Marchmont)	1,125	.. - 173	.. 26
.. W. (Glasgow; Douglas, Isle of Man)	1,225	.. - 115	.. 28
England, N.E. (Durham, York)	1,209	.. - 71	.. 28
.. N.W. (Stonyhurst, Blackpool, Llandudno)	1,143	.. + 92	.. 33
.. Mid. (Cirencester, Oxford, &c.)	1,281	.. - 59	.. 31
.. S. (London, Hastings, Southampton, &c.)	1,569	.. - 124	.. 34
.. E. (Hillington, Glaston, Cambridge)	1,558	.. - 82	.. 33
.. S.W. (Pembroke, Falmouth, Plymouth, &c.)	1,529	.. - 122	.. 35
Ireland, N. (Armagh, Markree Castle)	1,234	.. - 34	.. 28
.. S. (Dublin, Parsonstown, Valencia)	1,393	.. - 65	.. 32
Channel Islands (Jersey, Scilly)	1,734	.. - 180	.. 40

SUMMARY.

30'9 per cent. mean for United Kingdom, 1902.		34'1 per cent. mean for United Kingdom, 1897.	
43'4	1901.	31'8	1896.
39'6	1900.	35'8	1895.
36'6	1899.	31'1	1894.
33'5	1898.	37'0	1893.
or 35'38 per cent. mean for ten years.			

LIST OF PRESIDENTS

SINCE

THE FOUNDATION OF THE SOCIETY.

1821—5.	JOHN MARSHALL.
1826 & 7.	Rev. W. H. BATHURST, M.A.
1828—30.	MICHAEL THOS. SADLER, M.P.
1831 & 2.	WILLIAM HEY.
1833 & 4.	JAMES WILLIAMSON, M.D.
1835 & 6.	Rev. JOSEPH HOLMES, M.A.
1837—9.	Rev. RICHARD WINTER HAMILTON.
1840 & 1.	ADAM HUNTER, M.D.
1842—4.	JOHN HOPE SHAW.
1845—50.	Rev. WILLIAM SINCLAIR, M.A.
1851.	WILLIAM WEST, F.R.S.
1852 & 3.	Rev. CHARLES WICKSTEED, B.D.
1854—6.	JOHN HOPE SHAW.
1857.	JAMES GARTH MARSHALL, F.G.S.
1858.	Rev. W. F. HOOK, D.D.
1859 & 60.	Rev. ALFRED BARRY, M.A.
1861 & 2.	THOS. PRIDGIN TEALE, F.R.S.
1863—5.	Rev. THOS. HINCKS, B.A.
1866 & 7.	CHARLES CHADWICK, M.D.
1868—71.	JOHN DEAKIN HEATON, M.D.
1872 & 3.	Rev. CANON WOODFORD, D.D.
1874 & 5.	J. I. IKIN, F.R.C.S.
1876 & 7.	Rev. J. H. MCCHEANE, M.A.
1878—80.	T. CLIFFORD ALLBUTT, M.D., F.L.S.
1881 & 2.	Rev. JOHN GOTT, D.D.
1883 & 4.	J. E. EDDISON, M.D.
1885.	EDWARD ATKINSON, F.L.S.
1886—8.	THOMAS MARSHALL, M.A.
1889—91.	THOS. PRIDGIN TEALE, M.A., F.R.S.
1892 & 3.	Rev. J. H. D. MATTHEWS, M.A.
1894 & 5.	Rev. CHARLES HARGROVE, M.A.
1896 & 7.	EDMUND WILSON.
1898 & 9.	NATHAN BODINGTON, M.A., Litt.D.
1900 & 01.	J. H. WICKSTEED, M.Inst.C.E.
1902 & 3.	ARTHUR SMITHELLS, B.Sc., F.R.S.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Payments for the year ending 30th April, 1903.

RECEIPTS.			DISBURSEMENTS.		
To Balance in hand, May 1st, 1902	£	s. d.	By Repairs and Alterations...	£	s. d.
" Annual Subscriptions, viz. :—	...	29 0 1	Taxes	...	...
68 New Proprietary Members	...	...	" Fire Insurance	28 19 1	...
2 Ordinary	...	...	" Coal and Coke	12 10 0	...
52 New Ordinary	...	...	" Electric Lighting	21 4 3	...
93 Annual Subscribers, of 21s.	...	...	" Gas and Water	17 16 8	...
71 Annual Subscribers, of 7s. 6d.	...	...	" Cleaning	25 5 6	...
Arrears	...	...	" Furniture and Fixtures	11 12 6	...
" Rent, viz. :—	...	261 3 0	" Salaries and Wages	...	117 8 0
Lecture Room and Library	...	...	" Collector	273 5 6	49 8 5
Cellars	...	215 6 0	" Auditors	12 0 3	...
" Visitors to Museum	...	...	" Collections and Library	2 2 0	...
" School Children	...	...	Postages	...	287 7 9
" Sale of Guides	...	110 1 3	Advertising and Printing	12 13 6	33 1 1
" Sundries	...	26 7 2	Lectures	34 14 0	...
" Midland Railway Dividend	...	...	Telephone Co.	121 5 2	...
	...	4 10 10	Porter's Livery	10 0 0	...
	...	2 0 6	Sundries	6 0 0	...
	...	...	Coronation	12 0 3	196 12 11
	...	...	Balance in Bank	...	13 18 5
	...	...		...	16 0 8
	...	...		...	£751 14 1
	...	...		...	£751 14 1

We have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.

LEEDS, May 5th, 1903.

BEEVERS & ADGIE,
CHARTERED ACCOUNTANTS.

Capital Account.

£2,270 Preference 2½ per cent. Midland Railway Stock.

LIST OF DONATIONS AND ADDITIONS
TO THE
SOCIETY'S MUSEUM AND LIBRARY.

1902-1903.

*Those marked thus * are Honorary Members ; thus † Members or Subscribers
of the Society.*

ZOOLOGY.

- | | |
|---|--|
| Nest of Fink Bird, South Africa | } † Dr. Eddison. |
| Nest of Thrush, Adel..... | |
| Stoat in flesh, Adel..... | |
| Thrush in flesh | } Mrs. Eddison, Adel. |
| Wood Mouse (<i>Mus sylvatica</i>) in flesh | |
| Egg of Black Alligator (<i>Alligator sclerops</i>)..... | } Mrs. Colbeck, Demerara,
British Guiana. |
| Fine examples of the Chimpanzee
(<i>Anthropopithecus troglodytes</i>) and
Mandrill (<i>Papio maimon</i>), mounted
by Messrs. Lawrence & Co., Leeds | |
| Two skins of Golden Eagle (<i>Aquila chrysaetus</i>), and two mounted specimens (in case) of Barn Owl (<i>Strix flammea</i>)..... | } † Mr. W. Howgate. |
| A large and valuable collection of
Recent Foreign Shells, once the
collection of Mrs. John Wade, Leeds.
The series includes many fine specimens of <i>Strombus</i> , <i>Nautilus</i> , <i>Murex</i> ,
<i>Turbo</i> , <i>Mitra</i> , <i>Eburna</i> , <i>Harpa</i> , <i>Conus</i> ,
<i>Cypræa</i> , <i>Ovulum</i> , <i>Cymbium</i> , <i>Cassia</i> ,
<i>Triton</i> , <i>Scalaria</i> , <i>Helix</i> , <i>Spondylus</i> ,
<i>Ostrea</i> , <i>Venus</i> , <i>Brechites</i> , &c. | |
| Specimens of Lepidoptera :— Oak
Hook-tip (<i>Platypteryx namula</i>),
Thrift Clearwing (<i>Sesia philanthiformis</i>), Currant Clearwing (<i>S. tipuliformis</i>)..... | } † Henry Lupton, Headingley |
| | |

GEOLOGY.

- Volcanic Dust, Martinique and St. Vincent..... } Mrs. Colbeck, Demerara, British Guiana.
- Specimen of *Ceratites nodosus* from the Muschelkalk } Mr. R. Noel Middleton, Leeds.
- A series of Fossils from the Coal Measures of the Morley District, *Haloniarregularis*, *Calamites Schutzei*, *Lepidodendron aculeatum*, *Bothrodendron punctatum*, &c. } Mr. Lionel F. West, M.R.C.S., Morley.

ETHNOLOGY.

An extensive collection of objects from New Guinea, which includes pendant breast ornament (*musi kaka*), with tusks of boar (*Sus papuensis*) ornamented with red berries of *Abascus*, fastened with resin; armlets of shell (*tola*), of plaited grass (*sagiu*), bangles (*samba-sagiu*) worn above the calves, waist-bands for men; girdle dresses for women, of dyed grasses and palm leaves, netted bags (*nangeli-gun*) for carrying infants, pet pigs, puppies and fruit; gourds for quick-lime, eaten with betel-nut; Chunams for dipping up lime, shell spoons (*kai*); carved wood charms for boats, drums of wood with ends covered with snake's skin; Ornaments of feathers of Cockatoo, Bird of Paradise, Cassowary; Adzes, with stone and shell heads, bound with plaited rattan bindings; Arrows and fish-spears of wood and bone, bone implements (*dongan*) of bones of Cassowary; combs; Dresses, necklaces (*taotoa*), and other objects in shell; Pillows in wood; Fishing nets; native cloth; family tobacco pipes (*baurbau*); wooden shields; bow (*aral*) with bamboo string; wooden food-dishes, &c.....

The late Mr. James Bedford, Woodhouse Cliff, Headingley, and his family.

ARCHÆOLOGY.

- Ushabti figures from the excavations }
 at Abydos during 1901 } †Mr. A. Dodgson.
- Quartzite Palaeolithic Implements (6), }
 Laterite deposits, Poordi, India } Mr. H. W. Seeton-Karr, 21,
 Lingfield Road, Wimbledon
- Shoes of Pack-horses, found when }
 excavating in Burley Road, Leeds } †Mr. James E. Bedford,
 F.G.S.
- A small collection of Mycenaean ob- }
 jects, including vases, jugs, bowls, }
 portion of a two-horned Hera }
 idol, spinning whorls, stone orna- }
 ments, pounders and part of a }
 bronze spear socket, collected in }
 Cyprus..... } The Trustees of the British
 Museum.

PHOTOGRAPHS.

- A series of framed Photographs illus- }
 trating various aspects of the }
 geological scenery of Yorkshire } †Mr. James E. Bedford
 F.G.S.
- A bound series of photographs, illus- }
 trating the History of the Cowthorpe }
 Oak..... } Mr. John Clayton, Harro-
 gate.

NUMISMATICS.

- Silver Jubilee Medal of Queen Victoria †Mr. Richard Wilson.

PUBLICATIONS.

- Guide to Coral Gallery }
 Handbook of Instructions for Collectors }
 Southern Cross Collections } The Trustees of the British
 Museum.
- Ray Society, Vol. 1898, British }
 Annelids, Part II..... } †Mr. Henry Lupton, Lynd-
 hurst, Headingley.
- Annals of the Royal Observatory, }
 Edinburgh, Vol. I. } The Observatory.
- Effects of Weather upon Vegetation }
 (pamphlet) } Mr. John Clayton, Harro-
 gate.
- The Eruptions of the Soufrière in St. }
 Vincent, in 1902, and a visit to }
 Mount Pelée, in Martinique, Part I. } Dr. Tempest Anderson,
 York.

Leeds Directory, 1826	Mr. Joseph Moreton, Leeds.
Spink's "Numismatic Circular," 10 vols.	Purchased.
Catalogue of the Bateman Collection of Antiquities in the Sheffield Public Museum	Purchased.

PERIODICALS.

WEEKLY.

Nature	Purchased.
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MONTHLY.

Annals and Magazine of Natural History.....	Purchased.
Geological Magazine	Purchased.
Journal of the Chemical Society.....	Purchased.
Monthly Notices of the Royal Astro- nomical Society.....	The Society
Philosophical Magazine and Journal of Science.....	Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical Society.....	The Society.
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QUARTERLY.

Quarterly Journal of Microscopical Science.....	Purchased.
Quarterly Journal of Geological Society	The Society.
Zeitschrift für Wissenschaftliche Zoo- logie	Purchased.
Journal of the Linnean Society	Mr. Edward Atkinson F.L.S.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions.....	Purchased.
Proceedings of the Royal Society ...	The Society.
Proceedings of the Royal Institution } of Great Britain	The Institution.
Publications of the Ray Society	Purchased.
Fauna Gaskohle	Purchased.
Abridgments of Specifications for } Patents	The Comptroller - General of Patents.
British Association Report.....	The Association.
Greenwich Observations.....	The Astronomer-Royal.
Memoirs of the Royal Astronomical } Society	The Society.
Radcliffe Astronomical and Meteor- } ological Observations	Radcliffe Trustees.
Symons's British Rainfall	Purchased.
Monograph of the Palæontographical } Society	Purchased.
Proceedings of the Yorkshire Geological } and Polytechnic Society.....	The Society.
Transactions of the Leeds Naturalists' } Club and Scientific Association.....	The Association.
Transactions of the Leeds Geological } Association	The Association.
Transactions of the Leeds Astronomi- } cal Society	The Society.
Proceedings of the Liverpool Geo- } logical Society.....	The Society.
Journal of the Liverpool Geological } Association	The Association.
Natural History Transactions of } Northumberland, Durham, and } Newcastle-upon-Tyne.....	The Tyneside Naturalists' Field Club.
Proceedings of the Birmingham Philo- } sophical Society	The Society.
Annual Report of the Yorkshire } Philosophical Society	The Society.
Journal of the Anthropological Society	Purchased.

Transactions of the Leicester Literary and Philosophical Society	} The Society.
Report of the Committee of Leicester Town Museum	} The Museum.
Report of the Royal Institution, Hull	The Institution.
Report of the Meteorological Depart- ment of the Borough of Southport.	} The Meteorological Ob- server.
Report of the Bristol Museum	The Museum Committee.
Report of the Reading Museum	{ The Free Library and Museum Committee.
Annual Report of the Brighton Town Museum	} The Museum.
Annual Report, Middlesex Hospital...	The Hospital.
Annual Report of the Birkenhead Literary and Scientific Society	} The Society.
Proceedings of the Liverpool Literary and Philosophical Society	} The Society.
Annual Report and Proceedings of the Liverpool Science Students' Association	} The Association.
Memoirs and Proceedings of the Man- chester Literary and Philosophical Society	} The Society.
Transactions of the Manchester Geo- logical Society	} The Society.
Reports of the Manchester Museum Handbooks do. do.	} The Keeper.
Annual Report of the Sheffield Literary and Philosophical Society	} The Society.
Annual Report of the Chester Society of Natural Science and Literature	} The Society.
Journal of the Royal Institution of Cornwall	} The Institution.
Annual Report of the Royal Cornwall Polytechnic Society.....	} The Society.
Report of Associated Architectural Societies	} The Association.
Journal of the Chester Archæological and Historic Society	} The Society.

Geological Record	Purchased.
Transactions of the Yorkshire Naturalists' Union	} The Union.
Proceedings of the Royal Society of Edinburgh	
Transactions do. do.	} The Society.
Transactions of the Edinburgh Geological Society.....	
Proceedings of the Glasgow Philosophical Society	} The Society.
Proceedings of the Berwickshire Naturalists' Club	
Scientific Proceedings of the Royal Dublin Society.....	} The Society.
Scientific Transactions do.	
Transactions of the Royal Irish Academy	} The Academy.
Proceedings do. do.	
Journal of the Royal Geological Society of Ireland	} The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club	
Publications of the Royal Swedish Academy of Sciences.....	} The Academy.
Papers of the Royal University of Norway	
Bulletin of the Geological Institution of the University of Upsala	} The Institution.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhandling.....	
Bulletin, Société Impériale, Moscow...	} The Society.
Leopoldina" Amtliches organ der Kaiserlichen, Leopoldino-Carolinischen Deutschen Akademie der Naturforscher	
Mittheilungen der Kais. Königl. Geographischen Gesellschaft in Wien ...	} The Society.
Memoirs of the National Academy of Sciences	
	} The Academy.

Report of Australasian Association for the Advancement of Science.....	} The Association.
Journal and Proceedings of the Royal Society of New South Wales	} The Society.
Journal of the Royal Geographical Society of Australasia	} The Society.
Wealth and Progress of New South Wales	} The Agent-General.
Records of the Geological Survey of New South Wales	} The Surveyor.
Memoirs of the Geological Survey of New South Wales	
Annual Report and Papers of the Department of Mines and Agricul- ture, New South Wales	} The Department.
Prodromus of the Zoology of Victoria	} The Editor.
Records of the Australian Museum	} The Trustees.
Report of the Trustees of the Austra- lian Museum.....	
Proceedings of the Royal Society of Queensland	} The Society.
Queensland Agricultural Journal	} The Society.
Annals of the Queensland Museum...	} The Trustees.
Guide to Queensland	} The Government.
Transactions and Proceedings of the New Zealand Institute	} The Institute.
Papers and Proceedings of the Royal Society of Tasmania	} The Society.
Proceedings and Transactions of the Royal Society of Canada	} The Society.
Proceedings of the Canadian Institute	} The Institute.
Annual Report do.	
Transactions do.	
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	} The Institute.
Annual Report, Hamilton Public Library, Ontario, Canada	} The Librarian.
Journal and Proceedings of the Hamil- ton Association	} The Association.

Geological and Natural History Survey of Canada	} Department of the Interior.
Annual Report and Papers—do.	
Contributions to Canadian Palæon- tology	
Bulletin of the Natural History Society of New Brunswick.....	} The Society.
Memorias de la Sociedad Científica (Mexico)	} The Society.
“ Boletin Mensual ” Observatorio Meteorologico-Magnetico Central de Mexico	} The Editor.
Anuario del Observations Astrón- omico Nacional Mexico.....	} The Astronomer.
Boletin del Observatorio Astronómico Nacional de Tacubaya	} The Observer.
Report of the Museum National, Rio-de-Janeiro.....	} Directeur-Général.
Archivos do.	
Cape Meridian Observations	} Cape Astronomer-Royal.
Report of H.M. Astronomer at the Cape of Good Hope to the Secretary of Admiralty	
Transactions of the American Philo- sophical Society	
Proceedings do.	} The Society.
United States Geological Survey, Annual Report.....	} The Department.
Contributions to American Ethnology.	
United States Geographical and Geo- logical Survey	
United States Department of Agricul- ture, Publications of	} The Department.
Report of the Smithsonian Institution Smithsonian Miscellaneous Collections Smithsonian Contributions	} The Institution.
Annual Reports of the Bureau of Ethnology	
Miscellaneous Publications of the Bureau of Ethnology	

Proceedings of United States National Museum	}	The Museum.
Report do. do.		
Bulletins do. do.		
Transactions of the Academy of Science of St. Louis	}	The Academy.
Proceedings of the Academy of Natural Sciences of Philadelphia...		
Papers do. do.	}	The Academy.
Transactions of the Wagner Institute of Science, Philadelphia.....		
Proceedings of the American Academy of Arts and Sciences.....	}	The Academy.
Transactions of the Botanical Society of America		
Botanical Society of America		Society, Cornell University.
Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	}	The Academy.
Bulletins of the Wisconsin Geological and Natural History Society.. ..		
Memoirs of the National Academy of Sciences, Washington.....	}	The Academy
Bulletins of the Philosophical Society of Washington.....		
Proceedings of the Davenport Acad- emy of Natural Science.....	}	The Academy.
Transactions of the Wagner Free Institute of Science, Philadelphia ...		
Annual Report, Transactions, and Mis- cellaneous Papers of the Historical and Scientific Society of Manitoba	}	The Society.
Annual Report of the Trustees of the Cooper Union for the Advancement of Science		
Proceedings of the Boston Society of Natural History, U.S.A.	}	The Society.
Memoirs do.		
Bulletins of the Essex Institute, U.S.A.		The Institute.

Annual Report of the Curator of the Museum of Comparative Anatomy, Harvard College	} The College.
Annual Report of Harvard College	
Harvard University Catalogue	The University.
Annual Report of the Chicago Academy of Sciences.....	} The Academy.
Transactions of the Astronomical Observatory of Yale University ...	
Annual Report do.	} The University.
Report of the President of Yale University	
Catalogue do. do.	
Journal of the Elisha Mitchell Scientific Society	} The Society.
Tufts College Studies.....	
Transactions of the Meriden Scientific Association	} The Association.
Bulletins of the Buffalo Society of Natural Sciences..	
Bulletins of the University of Montana, Missoula	} The University.

LIST OF OFFICERS AND COUNCIL,

1903-1904.

OFFICERS.

PRESIDENT	{ ARTHUR SMITHELLS, B.Sc., F.R.S.
VICE-PRESIDENTS.	{ J. H. WICKSTEED, M.Inst.C.E. NATHAN BODINGTON, Litt.D.
HONORARY SECRETARIES	{ E. K. CLARK, M.A., M.Inst.C.E. J. B. COHEN, Ph.D.
TREASURER	RICHARD WILSON.
HONORARY CURATOR IN GEOLOGY	} R. H. KITSON, M.A.
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1903-1904.

** Members deceased, whose shares have not been transferred.*

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3	Armitage, Robert	.	Farnley.
4	*Arthington, Robert	.	
75	Bagshawe, Bernal	.	The Cedars, Headingley.
54	Bailey, Benson	.	Regent Park Terrace.
49	Baines, Mrs. Arthur	.	The Heath, Adel.
5	Baines, Mrs. H. S.	.	16, Mount Preston.
63	Barr, Frederick Horatio, J.P.	.	North Grange Road, Headingley.
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18	Bilbrough, Alfred	.	15, Beech Grove Terrace.
8	*Binks, Benj., Junr.	.	
45	Braithwaite, James, M.D.	.	Clarendon Road.
9	*Broadhead, Wm. Henry	.	
11	*Brown, James	.	
13, 14	*Calverley, Edmd. (2 shares)		
15	*Charlesworth, C. H.	.	
16	Chorley, Mrs.	.	9, Cavendish Road.
19	Close, James William	.	Greek Street.
26	Cousins, William James	.	Greek St. Chambers, Park Row.
39	Crawford, George Frederic	.	17, East Parade.
21	Cudworth, John W.	.	43, Mount Preston.
23	Dibb, Mrs. Elizabeth	.	
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28	Empson, Christopher	.	Mill Mount, York.

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 72 Gaunt, Leonard . Hazelbrae, Farsley.
 36-8 Gott, Wm. Henry (3 shares)
 61 Greenhow, Wm. T. . Newton Cottage, Chapel-Allerton
 44 Greenwood, Arthur . Greenholme, Burley-in-Wharfedale.
 27 Hall, William . Hillside, Headingley.
 64 Harding, Thomas Walter . Tower Works, Globe Road.
 42 Heaton, Beresford R. . Round Down, Gomshall.
 30 Horsfall, J., M.A., F.R.C.S.
 47 Ingham, John P. . 14, East Parade.
 51 Kinnear, Thos. John, M.A. The Abbey, Malton.
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 34 Lumb, George Denison . 31, Lyddon Terrace.
 57 Lupton, Charles, M.A. . The Harehills, Roundhay.
 32 Lupton, Edward Basil . Moorlands, Headingley.
 53 Lupton, Francis M., M.A. Rockland, Newton Park.
 56 Lupton, Sydney, M.A. . 102, Park Street, Grosvenor Sq., London, W.
 58 *Makins, Charles .
 77 Marsh, John Jenks . Cressy House, Woodsley Road.
 59 *Marshall, Arthur, F.G.S. .
 60 *Marshall, John, M.A. .
 66 Marshall, Reginald Dykes Castlerigg Manor, Keswick.
 67 Marshall, V. A. E., B.A. . Monk Coniston, Ambleside.
 50 Mason, Charles Letch . The Hollies, Cliff Road.
 65 Miall, Prof. Louis C., F.R.S. 1, Richmond Mount, Headingley.
 7 North, John . North Hill, Roundhay.
 68 Nunneley, J. A., M.B. . Bath.
 17 Padgett, Frederick A. . 17, Park Street.
 46 Raynar, Joseph Percival . Moorfield Lodge, Headingley.
 70 *Shepherd, John .
 10 Streatfeild, Richard James. The Rocks, Uckfield, Sussex.
 71 Tatham, Miss . Springfield Mount.
 52 *Taylor, Benjamin .

73	Teale, Lionel H.	. Moorside, Far Headingley.
74	Tottie, Mrs. John William	
35	Truro, The Bishop of	. Trenythron, Par Station, Cornwall.
76	Ward, William	. 12, Bank Street.
2	Warde-Aldam, W. W.	. Frickley Hall, Doncaster.
12	Wilson, Rev. Benjamin	. Christ Church Vicarage, Mirfield
78	Wilson, Edmund, J.P.	. Denison Hall.
33	Wilson, Henry B.	. Westfield, Armley.
31	Wilson, Richard	. Westfield, Armley.
63	Wilson, Reginald A.	. Westfield, Armley.
40, 41, 69	Wood, William Hoffman	. Park Square.
1	Wurtzburg, John Henry,	
	J.P.	. 2, De Grey Road.

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WITH AN ANNUAL SUBSCRIPTION OF ONE GUINEA

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39	Bailey, John Wm.	. St. Mark's Villas.
116	*Baines, Frederick	.
2	*Balme, E. B. Wheatley, M.A.	.
92	Barran, Alfred, J.P.	. Moor House, Headingley.
119	Barrett, Albert	. Holly Bush, Headingley.
17	Beaumont, James	. St. John's Cottage, Leeds.
91	*Bedford, James	.
15	Billbrough, Wm. Radford	. 15, Beech Grove Terrace.
121	Blackburn, Henry G.	. 2, East Parade.
4	*Boothroyd, William	.
89	Boston, Richard	. Boar Lane.
10	Bowling, John	. Newstead House, Spencer Place.
49	Braithwaite, William	. Throstle Nest, Horsforth.
5, 6	Brown, G. W. (2 shares)	. 78, Belsize Park Gardens, Hampstead, London, N.W.

37	Bulmer, Miss	.	Blenheim Lodge.
1	Burrell, Benjamin A., F.I.C.	5,	Mount Preston.
86	*Carter, J. B.	.	
9	*Chadwick, William	.	
77	Clark, Edwin Kitson, M.A., F.S.A., M.Inst.C.E.	.	Meanwoodside.
14	Conyers, W. H.	.	Dunluce, Ben Rhydding.
45	*Craven, John	.	
104	Crawford, John William	.	Newton Lane.
26	Elliot, Douglas	.	38, Park Row.
19	Fairbairn, Lady	.	Askham Grange, near York.
118	Flitch, John R.	.	Moortown.
3	Ford, Gervase Lawson	.	Lower Bentham, R.S.O., Yorks.
52	Fraser, Mrs. James B.	.	
87	Gibson, Rev. E. C. S., D.D.	.	Leeds Vicarage.
102-3	Gott, William Henry (P) (9 shares)	.	
106-10		.	
114-15		.	
22	Hargrave, Charles	.	
23	*Hargrave, James	.	
7	Hargrove, Rev. C., M.A.	.	10, De Grey Terrace.
16	Harvey, William	.	The Grove, Roundhay.
81	Hatch, S. C.	.	
51	Hoggard, Alfred	.	25, Cavendish Road.
98	Howgate, William	.	21, Blenheim Terrace.
36	*Hudson, Henry	.	
53	Hudson, Robert	.	Weetwood Mount, Far Head- ingley.
84	*Hummel, Prof. J. J., F.C.S.	.	
120	Ingham, Samuel	.	Headingley Hall.
56	James, Christopher William	.	Old Manor House, Potternewton.
96	*Jepson, Edward George	.	
40	Joy, William Lomas	.	
43	*Kitson, James	.	
46	Kitson, Robert Hawthorn, M.A.	.	Elmet Hall, Roundhay.
47	Kitson, Sir Jas., Bart., M.P.	.	Gledhow Hall.

- 48 Kitson, Mrs. F. W. . Burley Hill, Leeds.
 90 Lawson, Frederick W. . Oaklands, Adel.
 50 Leather, Ernest Arthur .
 21 Lupton, Arnold, M.Inst.C.E. 6, De Grey Road.
 95 Lupton, Arthur Greenhow Springwood, Roundhay.
 8 Lupton, Henry . Lyndhurst, Headingley.
 99 Lupton, Hugh . The Acacias, Roundhay.
 55 Lupton, Mrs. John . Moorlands, Headingley.
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 88 *McGuire, Thomas .
 94 Malcolm, John Cooper . Brighton Villa, New Leeds.
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 44 Merry, Mark Fenton . 14, St. John's Square, Wakefield.
 117 Middleton, Arthur . Calverley Chambers, Victoria Sq.
 72 Middleton, Robert . Sheepscar Foundry, Leeds.
 33 Muir, James .
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 30 Nicholson, Marshall . Middleton Hall, near Leeds.
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 67 Nunneley, A. G. .
 68 Oxley, James Walker . Spenfield, Weetwood.
 28 *Passavant, P. W. .
 82 Pearson, John Thomas . The Hall, Melmerby, S.O.
 11 Pegler, Thos. Boyne . 3, Sholebroke Avenue, Leeds.
 93 Phillips, J. S. R. . 55, Albion Street.
 38 *Ralph, John, M.A. .
 34 *Ransome, Prof. Cyril, M.A.
 69 Reynolds, Miss . 17, Ashwood Villas, Headingley
 18 Robson, A.W. M., F.R.C.S. Moor Road, Headingley.
 105 Ryder, Miss . Gledhow Hill.
 112 Sagar-Musgrave, J. M. . Red Hall, Shadwell.

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13	Stockdale, Miss Enid	Spring Lea, Springfield Mount.
57	Stringer, John William	Inglebank, Far Headingley.
73	Teale, T. P., M.A., F.R.S.	North Grange, Headingley.
74	*Teasdale, Washington, F R.A.S.	.
76	*Tennant, Thomas	.
78	*Tetley, F. W.	.
58	Thompson, Chas. F.	Beech Grove House.
79	*Turner, Richard B.	.
80	Wailes, William	2, Albion Place.
71	Ward, John, J.P.	Moor-Allerton House.
111	*Watson, William Henry	.
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97	Weston, Edward	.
42	*Whiting, John	.
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31	Wilkinson, William M.	220, Newton Hill.
85	*Wilson, John	.
35	Wood, Philip T.	.
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4	Barwick, J. M.	Low Hall, Yeadon.

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 40 Bodington, Prof. N., Litt.D. Shireoak Road, Headingley.
 8 *Bolland, W. T. .
 10 Bousfield, Charles Edward St. Mary's Mount.
 7 Branson, F. W., F.I.C. . Wynneholme, Far Headingley.
 15 Bray, George . Wood Lane, Headingley.
 72 Brigg, Matthew A. . 12, Sholebroke Avenue.
 11 Briggs, Riley . Springfield Mount.
 75 Brunton, George . Blenheim Terrace, Woodhouse Lane.
 74 Cohen, J. B., Ph.D. . 13, Cardigan Road, Headingley.
 41 *Crossley, John Edward .
 33 Denison, Samuel . 4, St. George's Terrace, Far Headingley.
 16 Denny, T. G. .
 32 *Dixon, A. S. .
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 22 Fairley, Thomas, F.R.S.E. 8, Newton Grove.
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 69 Fraser, James B. .
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 25 Goodman, Prof. John . The Yorkshire College.
 35 Grahl, Conrad E. . 19, Sholebroke Terrace, Chapel-town.
 12 Hadow, Reginald T. .
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 27 *Hargrave, John .
 60 Harland, J. W. . Headingley.
 78 Hawkesworth, Edwin . Sunnyside, Crossgates.
 28 Hepper, John, J.P. . Clareville, Headingley.
 30 Hobson, Alfred . Summercourt, Roundhay.
 81 *Holroyd, James .
 31 Illingworth, William . Flower Bank, Burley, Leeds.
 6 Jackson, Richard . 11, Spring Road, Headingley.
 67 Jefferson, Robert P. .

- 63 *Jowitt, Miss E. M. .
- 38 *Lawson, Thomas .
- 39 *Lawson, John .
- 23 Lupton, Arnold, M.Inst.C.E. 6, De Grey Road.
- 45 March, George . Oaklands, Scarcroft.
- 61 Mason, Charles Letch (P). The Hollies, Cliff Road.
- 9 Mathers, Miss .
- 52 Mecredy, Mrs. A. S. . Suffolk House, Cumberland
Road, Headingley.
- 37 Meredith, Mrs. . The Cottage, Stanningley Road,
Bramley.
- 46 Middleton, Gilbert . Calverley Chambers, Victoria Sq.
- 36 *Morley, R. B. .
- 49 *Myers, W. C. .
- 50 *Nelson, Henry .
- 70 Nelson, James Henry .
- 58 Nicol, W. H. . 12A, Clarendon Road.
- 51 *Nunneley, Thomas .
- 53 Nussey, Ernest . Victoria Road, Headingley.
- 54 Nussey, Thomas . Bramley Grange, Thorner.
- 55 Nussey, Mrs. S. L. . Potternewton Hall.
- 56 *Nussey, Mrs. Peter .
- 43 Powolny, E. Adolph . Harrogate.
- 59 Ramsbotham, S. H., M.D. . Fair Stead, Ripon Rd., Harrogate.
- 26 Ramsden, Arthur . 20, Cemetery Place, Woodhouse
Lane.
- 17 Redmayne, John . Grove House, Grosvenor Road.
- 62 *Riley, H. W. .
- 73 Rowley, Walter, C.E. . Alder Hill, Meanwood.
- 44 Rumboll, Mrs. . Cavendish Road.
- 68 *Smith, William Farrar .
- 76 Smithells, Prof. A., B.Sc.,
F.R.S. . Wood Royd, Ben Rhydding.
- 1 Stroud, Prof. W., D.Sc., M.A. Rupert Lodge, Grove Road.
- 77 *Titley, Anthony .
- 79 Tottie, Mrs. J. W. (P) .
- 64 Tweedale, John 12, South Parade.

82	Walker, H. B.	.	
83	Ward, Edmund	.	Cromer Hall, Mount Preston.
57	Ward, George, F.C.S.	.	Buckingham Ter., Headingley.
3	Webb, William Henry	.	Aire Street.
80	White, Ernest A.	.	Blundell Street.
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85	Willson, J. J.	.	Ballamona, Headingley.

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Chorley, R.	.	Cookridge Street.
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Croysdale, John	.	Westfield, Chapel-Allerton.

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| Green, William | . 1, Tanfield Place. |
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| Lawson, Sir Arthur T., Bart. | . Weetwood Grange, Far Headingley. |
| Legge, Rev. J. | . Cardigan Road. |
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| Moorman, F. W., B.A., Ph.D. | . 2, Hollin Lane, Far Headingley. |
| Mozley, J. R., M.A. | . 1 Holly Bank, Far Headingley. |
| Murphy, Albert J. | . Preston House, Tonbridge Street. |
| Myers, T. | . 32, Adolphus Street, Bradford. |
| Newill, Frank | . 9, Kelso Road. |

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Phillips, Rev. J. F.	. Emmanuel Vicarage.
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Sanders, T. W.	. 5, Blenheim Square.
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Smith, Thomas, M.D.	. Leathley Lodge, Hunslet Road.
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Tapp, C.	. 12, Hopefield Ter., Headingley.
Taylor, Mrs.	. Buckingham House, Headingley.
Teale, Michael A.	. Cookridge Street.
Tetley, C. F., M.A.	. Cardigan Road, Headingley.
Thompson, Vincent T., M.A.	. 195, Belle Vue Road.
Waddington, George	. 36, Great Wilson Street.
Walker, H. Secker, F.R.C.S.	. 45, Park Square.
Ward, Edward, M.A., M.B.	. 22, Park Place.
West, Lionel F., M.R.C.S.	. Morley.
White, Alfred, F.Z.S.	. Oakwood Avenue, Roundhay.
Wilkinson, J. J.	. Burnside, Skipton.
Wilkinson, William	. Ashton House, Hemingborough, E. Yorks.
Williamson, H. L.	. 4, St. Chad's Gardens, Far Headingley.
Wilson, D'Arcy B.	. Seacroft.
Wilson, J. R. R.	. West Hill, Chapeltown Road.
Wood, Thomas	. St. Mark's Ter., Woodhouse Lane

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Barran, Miss Edith	. Do.
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Bedford, Mrs.	. Woodhouse Cliff.
Birch, Mrs.	. 16, De Grey Terrace.
Booth, Meyrick	. 74, Richmond Av., Headingley.
Branson, Mrs. F. W.	. Wynnholme, Far Headingley.
Brunton, Miss	. Blenheim Terrace.
Butler, Mrs. Edmund	. Kirkstall Forge.
Butler, Miss	. Do.
Cameron, Mrs.	. Ridge Mount, Cliff Road.
Cohen, Mrs. J. B.	. 13, Cardigan Road.
Crampton, Charles	. Parcmont, Roundhay.
Cross, Mrs. J. R.	. Newlaithes Hall, Horsforth.
Croysdale, Mrs. J.	. Westfield, Chapel-Allerton.
Croysdale, Miss	. Do. do.
Croysdale, John H.	. Do. do.
Dodgshun, Mrs. C. C.	. Hyde Terrace.
Dodgson, Mrs. A.	. Southleigh, Headingley.
Foster, Mrs. George	. Castlestead, Boston Spa.
Gardner, Mrs. Wilson	. 10, Norwood Ter., Headingley.
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Grant, Mrs.	. 13, Cromer Terrace.
Green, Miss	. 1, Tanfield Place.
Green, Miss Ethel	. Do.
Griffith, Mrs. T. Wardrop	. 43, Park Square.
Haigh, Miss	. 30, Lyddon Terrace.
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Hannam, Mrs. W. S.	. 4, East Parade.
Hellier, Mrs.	. Glengariff, North Grange Road.
Hepper, Miss M. E.	. Clareville, Headingley.
James, Mrs.	. 1, Park Square.

Keenan, Miss	. 2, Woodlands, Weetwood Lane.
Kitson, Mrs. F. J.	. 1, Gledhow Grange, Chapeltown.
Lane, Miss	. Girls' High School, Leeds.
Legge, Miss	. Cardigan Road.
Moorman, Mrs.	. 2, Hollin Lane, Far Headingley.
Nelson, Miss C. E.	. 34, Hyde Terrace.
Nelson, Miss Louisa	. Do.
Newill, Miss	. 9, Kelso Road.
Nicholson, Mrs.	. Moorfield House, Headingley.
Nicholson, Miss	. Do. do.
Nicholson, Wilfred E.	. Do. do.
Nussey, Miss	. Potternewton Hall.
Oldfield, Miss	. 30, Lyddon Terrace.
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Phillips, Miss Dorothy	. Hazel House, Methley.
Porter, Miss	. Flower Bank, Burley.
Ramsden, Mrs. B.	. Cemetery Place, Woodhouse Lane
Redmayne, Mrs. John	. Grove House, Headingley.
Richardson, Mrs.	. 1, Montpelier Terrace.
Ryder, Miss E. I.	. Gledhow Hill.
Ryder, Miss Louisa	. Do.
Seymour, Miss E.	. Morley.
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Talbot, Mrs. G.	. Southfield, Burley.
Tannett-Walker, Mrs. A. T.	. The Elms, Weetwood.
Tapp, Mrs. C.	. 12, Hopefield Terrace.
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Taylor, T. L.	. Do. do.
Teale, Miss	. North Grange, Headingley.
Tetley, Mrs. C. F.	. Cardigan Road, Headingley.
Ward, Mrs. G.	. Buckingham Terrace.
Webb, Miss	. Aire Street.
Williamson, Mrs. H. L.	. 4, St. Chad's Gardens, Far Headingley.

Willson, Miss Emilie Dorothy	.	Ballamona, Headingley.
Willson, Miss Margaret	.	Do.
Wilson, Mrs.	.	West Hill, Chapeltown Road.
Wood, Miss	.	St. Mark's Ter., Woodhouse Lane

Members and Subscribers are requested to inform the Curator of any errors that may be found in the above list.

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- | | |
|---|--|
| Professor T. Clifford Allbutt,
M.D., F.R.S., Cambridge. | Cyril Graham, B.A., 9, Cleveland
Row, St. James's, London, S.W. |
| The Right Hon. Lord Avebury,
D.C.L., LL.D., F.R.S., High
Elms, Hayes, Kent. | Wm. Hancock, F.L.S., F.R.G.S.,
c/o Commissioner of Customs,
Kowloon, Hong Kong, China. |
| The Right Rev. Bishop Barry,
D.D., Canon of Windsor,
Windsor. | Wm. Hartley, Durban, Port
Natal. |
| Prof. Graham Bell, The National
Telephone Company, Milk
St., Boston, Mass., U.S.A. | Capt. James Holt, A.D.C.,
Government House, Wellington,
New Zealand. |
| Sir Frederick J. Bramwell, Bart.,
F.R.S., M.Inst.C.E., 5, Great
George Street, Westminster. | Sir Clements R. Markham,
K.C.B., F.R.S., F.L.S., Pres.
R.G.S., 21, Eccleston Square,
Piccadilly, London, S.W. |
| Duca Frederico Lancia di Brolo. | The Chevalier Michelotti. |
| Dr. Day, Mendoza, Argentine
Republic. | H. G. Moore, Glenmark, New
Zealand. |
| Herr Franz Foetterle, Secretary
of the Imperial Royal Geo-
graphical Society of Vienna. | Sir Charles Nicholson, Bart.,
D.C.L., &c., The Grange,
Totteridge, Hertfordshire. |
| Francis Galton, F.R.S., 42, Rut-
land Gate, Knightsbridge,
London, S.W. | C. C. Oxley, Minster House,
Ripon. |
| The Hon. W. A. B. Gellibrand,
Cleveland, Ouse, Tasmania. | Sir T. Wemyss Reid, LL.D., 26,
Bramham Gardens, South
Kensington, London. |

The Most Hon. the Marquis of Ripon, K.G., F.R.S., F.G.S., Studley Royal, Ripon.	Col. Edmd. Smyth.
Sir A. W. Rücker, D.Sc., I.L.D., F.R.S., 19, Gledhow Gardens, London.	Prof. T. E. Thorpe, C.B., D.Sc. Ph.D., F.R.S., Somerset House London. Edward Harry Woods, Rosario, Argentine Republic.

THE
EIGHTY-FOURTH REPORT
OF
THE COUNCIL
OF THE
LEEDS
PHILOSOPHICAL AND LITERARY
SOCIETY,

AT THE CLOSE OF THE SESSION 1903-1904.

READ AT THE ANNUAL MEETING, MAY 3rd, 1904.

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—
1904.

THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY consists of the following Classes of Members and Subscribers:—

- (1.) ORIGINAL PROPRIETARY MEMBERS (holding £100 Shares), who are entitled to personal admission to the Museum, Library, Lectures, and all other Meetings of the Society, and to two transferable tickets to admit visitors to the Lectures. They are exempt from Annual Subscription.
- (2.) NEW PROPRIETARY MEMBERS (holding £50 Shares), who are entitled to similar personal privileges, and to two transferable tickets. Subscription, £1 1s. per annum.
- (3.) ORIGINAL ORDINARY MEMBERS (holding £3 3s. Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £2 2s. per annum.
- (4.) NEW ORDINARY MEMBERS (holding £20 Shares), who are entitled to similar personal privileges, and to one transferable ticket. Subscription, £1 1s. per annum.

The following are entitled to personal admission to the Museum, Library, and Lectures, but not to business meetings; nor have they any transferable tickets to admit visitors:—

- (5.) HONORARY MEMBERS, elected on the recommendation of the Council.
- (6.) SUBSCRIBERS of £1 1s. per annum.
- (7.) SUBSCRIBERS of 7s. 6d. per annum, being Ladies or Young Persons resident with Members, or with Subscribers in Class (6).

A list of shares offered for sale is kept in the office, and information as to price, &c., may be obtained from the Curator.

IMPORTANT RULES RESPECTING THE PROPERTY OF THE SOCIETY, &c.

In the event of a dissolution of the Society, its property and effects, whether real or personal, shall not be disposed of for the individual benefit of the Members, but shall be appropriated for the advancement of Science, Literature, or Art, in the town of Leeds; and the mode of such appropriation shall, as to the proceeds of the real Estate, be determined by a majority of the Proprietary Members, and as to the proceeds of the personal Estate by a majority of both Proprietary and Ordinary Members voting at Meetings convened specially for that purpose.

The Society shall be dissolved if the total number of Members (Proprietary and Ordinary) be reduced below fifty; and it shall be at any time lawful to dissolve it with the consent in writing of a majority of Members holding not less than two-thirds of the Proprietary Shares for the time being.

REPORT OF THE COUNCIL

AT THE END OF THE

EIGHTY-FOURTH SESSION.

The thanks of the Society are due to the President (Prof. Smithells, F.R.S.), and Prof. W. R. Phillips, who gave valuable lectures before the members during the past session.

On the retirement of Prof. Smithells from the position of President, the Council wish to record their appreciation of the services rendered by him as an officer of the Society. Since he was elected Honorary Secretary in 1891, not only has he devoted himself constantly to further the interests and continue the traditions of the Society, but he has at different times presented to the members the modern advances made in Chemical and Physical Science. The five lectures for which the Society has to thank him will long be remembered; they proved as delightful in expression as they were remarkable in matter.

The full Lecture list is as follows:—

- 1.—“Radium and its Problems.” By the PRESIDENT. *Oct. 20th, 1903.*
- 2.—“The Manufacture and Use of Stone Implements.” By BERTRAM C. A. WINDLE, M.D., Sc.D., F.R.S. *Nov. 3rd, 1903.*
- 3.—“Plants and their Insect Visitors.” By F. E. WEISS, D.Sc. *Nov. 17th, 1903.*
- 4.—“A Modern Sculptor: Auguste Rodin.” By D. S. MACCOLL, M.A. *Dec. 1st, 1903.*
- 5.—“Shakespeare’s Theatre.” By A. C. BRADLEY, M.A., LL.D., D.Litt. *Dec. 15th, 1903.*
- 6.—“A Yorkshire Yeoman Family, 1350-1800.” By KARL PEARSON, F.R.S. *Jan. 5th, 1904.*

- 7.—“Dramatic Music, 1600-1876.” By HERBERT THOMPSON, M.A., LL.M. *Jan. 19th, 1904.*
- 8.—“Sculpture from the Wreck of an Ancient Ship.” By ERNEST GARDNER, M.A. *Feb. 2nd, 1904.*
- 9.—“Bird Watching at the Eddystone: a Study in Migration.” By W. EAGLE CLARKE, F.R.S.E., F.L.S. *Feb. 16th, 1904.*
- 10.—“Legal Documents from Early Assyria.” By W. R. PHILLIPS, M.A., LL.M. *Mar. 1st, 1904.*
- 11.—“Phosphorescence.” By HERBERT JACKSON. *Mar. 15th, 1904.*
- 12.—“Does History repeat itself? An examination of the latest theories of History.” By EMIL REICH, *Doctor Juris.* *April 12th, 1904.*

The Members and Subscribers are comprised in the following classes:—

	1903.	1904.
Original Proprietary Members (Shares 78) ...	53	53
New Proprietary Members (Shares 79)... ..	69	69
Ordinary Members	2	2
New Ordinary Members	53	53
Annual Subscribers	100	91
Annual Subscribers of 7s. 6d.	73	66
	<u>379</u>	<u>363</u>

There has been a slight reduction in the number of subscribers for 1904. This reduction the Council have under their consideration and may be in a position to make an important recommendation to the Society on the subject in the course of the next year.

The Council regret that they have to report the death of Mr. J. J. Willson during the last session. Mr. Willson had been a member of the Society for 33 years, and had acted on the Council from 1888 to 1903. In former years, when the Society held its Annual Conversazione, Mr. Willson was always ready to place his artistic knowledge at the disposal of the Council in order to render these meetings attractive.

Three Christmas Lectures were given by the Curator:—
 “The Ancestry of a Penny,” illustrated by the “Baron” collection of coins, the property of the Society.

“How Wild Beasts devour their Food.”

“British Snakes and other Reptiles.”

The attendances at these lectures are the best so far recorded.

The series of lectures for school children, which was arranged in 1901, by the Leeds and District Association of the National Union of Teachers, has been continued, and a course on “Insect Life” has been delivered by Mr. Crowther.

Mr. Whitmell, H.M.I.S., has kindly furnished a report on the lectures delivered during the present session, from which we abstract the following:—

“During the present session, 14,739 children have visited the Museum, in charge of 430 teachers. Mr. Crowther has delivered his lecture 46 times. This gives an average of 320 children at each visit, in charge of 9 teachers and the supervisor (a Head Teacher specially chosen to take full control of the arrangement).

Almost every child in Standards V., VI., VII., and many children in Standard IV., from all the Elementary Schools of the City, have been included; and a considerable number of these have visited the Museum for three years in succession.

The scheme arouses the interest of the children in the Study of Nature. It excites their curiosity, gives them an inquiring turn of mind, and supplies them with a certain amount of useful information. The tour round the rooms is of great service in developing the powers of observation in the children, whilst the subsequent essay-writing gives them a useful exercise in expressing simply and correctly what they have learnt.

The principal aim of the scheme is to give the children a real liking for the Study of Nature in all its aspects, and to teach them how to use and enjoy a Museum.

Already it is found that many of the children now pay visits to the Museum of their own accord.

Specialisation and detailed work are not aimed at, and do not seem desirable. The object is rather to stimulate a healthy curiosity, and to awaken the mental faculties.

The chief disadvantages in the scheme appear to be:— (1) The fact that, during each session, the arrangements provide for only one visit for each child; (2) The large number of children (about 36) in charge of each teacher. It is to be hoped that, in the future, these drawbacks may be removed.

The scheme has met with cordial sympathy, and is a conspicuous success—a success due, in the first place, to the fact that the scheme originated with the teachers, and, in the second, to the unselfish enthusiasm of Mr. Crowther, who spares no pains to make the children's visits both profitable and pleasurable."

A special lecture, preliminary to the above series, was given by Mr. Crowther to 361 teachers, on "Insect Life," and one of your Honorary Secretaries attended in order to give a welcome in the name of the Society to those present. Further, by arrangement, many children outside the scheme have been able to participate in the advantages it offers of learning more about the objects in the Society's Museum.

The thanks of the Council are due to the Leeds Association of the National Union of Teachers and to the Committee of Management of the Scheme for Scholars visiting the Museum, of which Mr. J. Lang is Chairman, and Mr. J. W. Jacob, Hon. Secretary, to the Supervisors, and to many others who have so willingly helped to make the lectures a success.

The average number of Visitors to the Museum during the last ten years is 24,324, the number of visitors during 1903-4 was 22,737. This number does not include the 14,739 children who have come to the Museum under the above scheme.

Visits have been made to the Museum by batches of school children from Leeds, Burley-in-Wharfedale, Rigton, Morley, Woodlesford, under the care of teachers; in each case the

admission was half-price in accordance with the minute of Council dated 1893.

The Council wish to express their acknowledgment of the care and interest which Mr. Dodgson has continued to devote to the "Baron" collection of coins, and are glad to record that this collection has formed the subject of an interesting lecture to the Leeds Astronomical Society by the Hon. Librarian.

The following is Mr. Dodgson's report:—

"During the year 1903-4 the following coins in the Society's cabinets have been identified, classified, catalogued, and ticketed:—

Roman Medallions	...	...	...	...	...	...	{ silver 10 bronze 4
English coins from Henry VIII. to Edward VII.	...	...	...	...	...	...	{ gold 33 silver 337
Scotch, from William I., known as "William the Lion,"	...	...	...	...	...	...	{ gold 3 silver 25
A.D. 1165	...	...	...	...	...	...
Oriental, from the early Khalifs A.D. 685 to the 20th	...	...	...	...	...	...	{ silver 71 copper 43
Century	...	...	...	...	...	...
Japan, Cochin China, and Siam	...	...	...	...	...	...	silver and bronze 5

MEDALS.

Papal	...	...	...	...	...	...	{ silver 64 bronze 5
Napoleonic	...	...	...	...	...	...	{ silver 17 bronze 6
English Celebrities	...	...	...	...	...	...	{ silver 33 bronze 8
Continental Celebrities	...	...	...	...	...	...	bronze 124

Descriptions of 240 of the above coins have been typewritten, also of 553 coins, of which a catalogue had been previously written

The Oriental coins include coins of the early Mohammedan Khalifs, of the Seljookees and Mongols of Persia; the Zodiacal coins of Shah Jahangir (1605-1627); of the Kings of Oude, Nepaul, Assam, Mysore, Burma, as well as the Portuguese, French, Dutch, and East India Company's issues, and the Ottoman Turks."

The Council acknowledge with thanks a donation of £20 towards Lecture Hall expenses, during the Conference of the Institution of Mechanical Engineers, from the Leeds Reception Committee of the Institution of Mechanical Engineers. During the years of 1903 and 1904 the distinguished office of President of the Institution of Mechanical Engineers is occupied by Mr. Wicksteed, one of the past Presidents of the Philosophical Society, and the Council have great pleasure in calling the attention of members to the fact that the present is the first occasion on which this honourable position has been held by a Leeds citizen.

The Council own with thanks the receipt of many valuable gifts.

A small collection of animals (in spirit) from Cape Colony, presented by Mr. Fred Atkinson, Aberdeen, Cape Colony.

A beautiful, well-preserved skin of a Vulture, a Neptune's Cup, one of the giant sponges, and other objects from Mr. William Howgate.

Several birds, in the flesh, from Mr. J. W. Marsden, and mammals from Mrs. Eddison.

Mr. W. T. Crampton has presented a cabinet containing a large collection of Birds' Eggs and Nests. The eggs, some 1,700 in number, are of both British and Foreign species of Birds and are so arranged as to show generic relationship. The nests include many interesting forms, Nightingale, Hawfinch, Shrikes, Crow, Coot, etc. Some nests contain the eggs of the parasitic Cuckoo and Cowbird. The gift is a most acceptable addition to our collections. The requests to see this collection had to be met by a public exhibition in the Library, which was well attended.

The donation includes also a series of casts of the eggs of the Moa, Epiornis, Apteryx, and Great Auk.

Mr. Crampton has further increased the indebtedness of the Society to him by a gift of a valuable collection of Birds in cases,

amongst which is a large case representing animals found in the Island of Mull, the specimens in which are appropriately mounted to suit their natural surroundings.

A large series of Platinotype Prints of the chief geological features of Britain, specially prepared by the donor, Mr. Godfrey Bingley, from his own negatives.

Major Tottie, of Bell Busk, has presented a number of cork Models, made to scale by Mr. Richard Tottie, about 1814-1825. They include Fountains Abbey; Stonehenge; the Temple of Neptune, Pæstum; The Temple of Vesta, Tivoli; Coliseum, &c The disposal of these is left in the hands of the Council.

Mr. Claude W. Atkinson, of Beckenham, has presented a number of Dutch tiles, formerly belonging to Mr. Edward Birchall, and also a copy of Gneecchi's "Manual of Roman Coins."

Mr. G. H. Corringham has given seven silver Indian and African Coins, chiefly peacock rupees or parts of that coin; Mr. Henry March a Medal of Pius IX.; and Mrs. Craig a first brass coin of Antoninus.

Mr. J. R. Ford has presented to the Library Samuel Birchall's "Descriptive List of Provincial Copper Coins or Tokens, issued between 1786 and 1796."

In the South Geological Room, the wall cases have all been reconstructed to allow of better lighting, new shelves of glass substituted for those of wood, and the specimens re-arranged. It is proposed to put in the cases photographs of geological interest, which have been prepared by Mr. Godfrey Bingley.

For better protection and display, the "Hebden" collection of British Shells has been remounted in glass-topped boxes.

The British Mammal cases have been reconstructed in order to ensure better lighting and exhibition of these animals.

A number of cases has been purchased for the display of objects for the school children ; in these, and, other cases already possessed by the Society, Insects have been arranged for the convenience of examination after the Museum Lectures. Each case is numbered, and the objects classified to facilitate ready reference to the printed syllabus, supplied to each child at the cost of the Leeds City Council.

During the past year the Lecture Theatre has been thoroughly cleaned and decorated, the ceiling and top portion of the walls have been made a plain white, and a high dado of bright red carried round the lower part of the walls. New linoleum has been laid down the gangways and on the dais, india-rubber treads have been placed on the stairs ; an electric fan has been inserted in one of the windows. These improvements have entailed considerable cost, but have attained the result of making the Hall lighter, more attractive, and better ventilated than it has been for many years.

There is an adverse balance due to cost of painting, cleaning, re-carpeting, and ventilating the Lecture Hall, to law expenses, and to compensation for injury, which will be met in the coming year by the increased grant for visits of school children, and the summer lettings of the Hall to the Musical Festival Committee.

It is hoped that in the ensuing year there will be no occasion for incurring the special costs which have arisen in 1903-4. But the cleaning and re-painting of the staircase and upper rooms cannot now be long delayed.

SUMMARY OF METEOROLOGICAL OBSERVATIONS TAKEN AT THE
PHILOSOPHICAL HALL, AND AT LAUNSWOOD, DURING THE YEAR 1903.

1903.	Mean Height of Barometer (inches).	Mean Temperature of Air (degrees).	Amount of Rainfall.	
			Museum (inches).	Lawnswood (inches).
January	29·687	39·7	2·11	1·93
February	29·808	45·2	1·90	2·03
March	29·482	45·4	3·02	3·28
April	29·642	44·1	1·28	1·79
May	29·692	51·8	3·29	3·42
June	29·878	56·2	1·40	1·54
July	29·605	60·3	2·34	3·47
August	29·543	58·2	2·24	2·72
September	29·500	55·1	3·93	3·46
October	29·357	49·5	6·79	7·68
November	29·794	43·8	1·14	1·49
December	29·476	39·6	1·13	1·16
Yearly Means ...	29·622	49·1	30·57	33·97

EXTREMES FOR THE YEAR 1903.

Greatest Barometric pressure—30·55 inches on January 13th, the Temperature of the Mercury being 41°; Least pressure—28·47, on March 1st, the Temperature of the Mercury being 44°.

Greatest degree of Heat, indicated by the Thermometer in the shade—84° on July 9th; Minimum—24° on January 15th.

Greatest fall of Rain (during 24 hours)—1·09 inches on September 10th. Average yearly Rainfall at the Museum for the ten years 1894—1903, 26·07 inches.

PERCENTAGE OF SUNSHINE AT THE MUSEUM, COMPARED WITH
THAT RECORDED AT ADEL, ADEL BEING RECKONED AS 100.

1890... ..	69·3 per cent.	1897... ..	83·5 per cent.
1891... ..	69·9 „	1898... ..	79·1 „
1892... ..	69·0 „	1899... ..	82·8 „
1893... ..	77·1 „	1900... ..	78·0 „
1894... ..	82·2 „	1901... ..	85·5 „
1895... ..	84·0 „	1902... ..	82·4 „
1896... ..	76·0 „	1903... ..	87·5 „

The adopted Mean Temperature of the Air is the mean of the following four daily readings:—(a. and b.) Dry Bulb Thermometer read at 10 a.m. and 4 p.m.; (c. and d.) Maximum and Minimum Thermometers, all the instruments in a screen.

The Hall is situated at 1° 32' 45" W., and 53° 47' 51" N.

The Bench Mark at the corner of the Philosophical Hall is 131·8 feet above sea level, and 10 inches above the pavement. The Cistern of the Barometer is 12·8 feet, the Thermometers are 42 feet, and the Rain-gauge is 45 feet above the Bench Mark.

SUNSHINE AT LEEDS IN 1903.

The observations recorded below were made by Jordan's Photographic Sunshine Recorder at the following stations in Leeds:—

1. The Museum of the Philosophical and Literary Society, situate in the centre of the city; elevation above the sea, 145 feet. Recorder—Mr. HENRY CROWTHER, Curator.
2. Woodhouse Cliff, $1\frac{1}{2}$ miles N.W. from the centre of the city; elevation, 330 feet; residential suburb. Recorder—Mr. W. GIBSON, Cliff Lodge.
3. Lawnswood Cemetery, Adel, 4 miles N.W. from the centre of the city; elevation, 475 feet; on the fringe of the city. Recorder—Mr. S. R. DYSON.

Months.	Stations.	Hours of sunshine registered.	Percentage of possible Duration.
JANUARY	1	16'50	7'1
	2	19'30	8'1
	3	21'20	8'8
FEBRUARY	1	43'10	18'0
	2	49'10	18'4
	3	56'40	21'2
MARCH	1	128'50	32'6
	2	133'30	36'6
	3	147'10	40'4
APRIL	1	178'50	42'7
	2	201'30	48'2
	3	208'40	49'9
MAY	1	141'30	28'7
	2	153'40	31'2
	3	167'50	34'1
JUNE	1	186'10	36'7
	2	207'00	40'9
	3	200'00	39'5
JULY	1	193'15	38'2
	2	200'50	39'6
	3	214'10	42'3
AUGUST	1	165'20	36'1
	2	188'15	41'4
	3	189'50	41'7
SEPTEMBER	1	156'55	41'9
	2	165'55	44'3
	3	161'00	43'0
OCTOBER	1	61'25	19'1
	2	78'10	24'4
	3	78'30	24'5
NOVEMBER	1	40'50	16'3
	2	47'40	18'4
	3	52'40	21'1
DECEMBER	1	15'00	6'8
	2	19'50	8'7
	3	24'20	10'9

SUMMARY FOR THE YEAR.

Hours recorded.		Difference from mean of ten years in hours.		Percentage of possible duration.
	H. M.	H. M.		
Museum ..	1,333 05	..	+59 32	29'91
Woodhouse Cliff ..	1,465 00	..	+47 09	32'52
Lawnswood ..	1,522 10	..	- 4 03	34'17
32'2 per cent. mean for 1903.			27'8	per cent. mean for 1898.
30'1	1902.		31'4	1897.
37'5	1901.		26'5	1896.
30'7	1900.		37'5	1895.
32'1	1899.		29'0	1894.
or 31'4 per cent. mean for ten years.				

The Meteorological Office publishes the following Records of Sunshine for 1903, as observed at stations taken as representing specified districts:—

Stations.	Number of Hours.	Difference from mean, hours.	Percentage of possible duration.
Scotland, N. (Stornoway, &c.) ..	1,038	- 81	24
.. E. (Aberdeen, Marchmont) ..	1,165	- 133	2
.. W. (Glasgow; Douglas, Isle of Man) ..	1,297	- 42	3
England, N.E. (Durham, York) ..	1,275	- 107	29
.. N.W. (Stonyhurst, Blackpool, Llandudno)	1,390	+ 57	32
.. Mid. (Cirencester, Oxford, &c.) ..	1,264	- 98	29
.. S. (London, Hastings, Southampton, &c.)	1,531	- 68	35
.. E. (Hillington, Geldeston, Cambridge)	1,445	- 139	33
.. S.W. (Pembroke, Falmouth, Plymouth, &c.)	1,517	- 115	34
Ireland, N. (Armagh, Markree Castle) ..	1,186	- 81	27
.. S. (Dublin, Parsonstown, Valencia) ..	1,336	- 119	31
Channel Islands (Jersey, Scilly) ..	1,754	- 133	40

SUMMARY.

30'8 per cent. mean for United Kingdom, 1903.	33'5 per cent. mean for United Kingdom, 1898.
30'9 1902.	34'1 1897.
43'4 1901.	31'8 1896.
39'6 1900.	35'8 1895.
36'6 1899.	31'1 1894.
or 34'70 per cent. mean for ten years.	

LIST OF PRESIDENTS

SINCE

THE FOUNDATION OF THE SOCIETY.

1821-2 : 1822-3 : 1823-4 :	}	JOHN MARSHALL.
1824-5 : 1825-6 :		
1826-7 : 1827-8.		Rev. W. H. BATHURST, M.A.
1828-9 : 1829-30 : 1830-1.		MICHAEL THOS. SADLER, M.P.
1831-2 : 1832-3.		WILLIAM HEY.
1833-4 : 1834-5.		JAMES WILLIAMSON, M.D.
1835-6 : 1836-7.		Rev. JOSEPH HOLMES, M.A.
1837-8 : 1838-9 : 1839-40.		Rev. RICHARD WINTER HAMILTON.
1840-1 : 1841-2.		ADAM HUNTER, M.D.
1842-3 : 1843-4 : 1844-5.		JOHN HOPE SHAW.
1845-6 : 1846-7 : 1847-8 :	}	Rev. WILLIAM SINCLAIR, M.A.
1848-9 : 1849-50 :		
1850-1 : 1851-2.		WILLIAM WEST, F.R.S.
1852-3 : 1853-4.		Rev. CHARLES WICKSTEED, B.D.
1854-5 : 1855-6 : 1856-7.		JOHN HOPE SHAW.
1857-8.		JAMES GARTH MARSHALL, F.G.S.
1858-9.		Rev. W. F. HOOK, D.D.
1859-60 : 1860-1.		Rev. ALFRED BARRY, M.A.
1861-2 : 1862-3.		THOS. PRIDGIN TEALE, F.R.S.
1863-4 : 1864-5 : 1865-6.		Rev. THOS. HINCKS, B.A.
1866-7 : 1867-8.		CHARLES CHADWICK, M.D.
1868-9 : 1869-70 : 1870-1 :	}	JOHN DEAKIN HEATON, M.D.
1871-2 :		
1872-3 : 1873-4.		Rev. CANON WOODFORD, D.D.
1874-5 : 1875-6.		J. I. IKIN, F.R.C.S.
1876-7 : 1877-8.		Rev. J. H. MCCHEANE, M.A.
1878-9 : 1879-80 : 1880-1.		T. CLIFFORD ALLBUTT, M.D., F.R.S.
1881-2 : 1882-3.		Rev. JOHN GOTT, D.D.
1883-4 : 1884-5.		J. E. EDDISON, M.D.
1885-6.		EDWARD ATKINSON, F.L.S.
1886-7 : 1887-8 : 1888-9.		THOMAS MARSHALL, M.A.
1889-90 : 1890-1 : 1891-2.		THOS. PRIDGIN TEALE, M.A., F.R.S.
1892-3 : 1893-4.		Rev. J. H. D. MATTHEWS, M.A.
1894-5 : 1895-6.		Rev. CHARLES HARGROVE, M.A.
1896-7 : 1897-8.		EDMUND WILSON.
1898-9 : 1899-1900.		NATHAN BODINGTON, M.A., Litt.D.
1900-1 : 1901-2.		J. H. WICKSTEED, M.Inst.M.E.
1902-3 : 1903-4.		ARTHUR SMITHELLS, B.Sc., F.R.S.
1904-5.		J. E. EDDISON, M.D.

LEEDS PHILOSOPHICAL AND LITERARY SOCIETY.

Statement of Receipts and Payments for the year ending 30th April, 1904.

RECEIPTS.			DISBURSEMENTS.		
	£	s. d.		£	s. d.
To Balance in hand, May 1st, 1903 ...	...	...	By Repairs and Alterations...	...	...
„ Annual Subscriptions, viz.:—			„ Taxes ...	...	...
71 New Proprietary Members ...	74	11 0	„ Fire Insurance ...	...	...
2 Ordinary ...	4	4 0	„ Coal and Coke ...	24	2 8
49 New Ordinary ...	51	9 0	„ Electric Lighting ...	33	5 1
89 Annual Subscribers, of 21s. ...	93	9 0	„ Gas and Water ...	21	15 8
68 Annual Subscribers, of 7s. 6d. ...	25	10 0	„ Cleaning ...	15	16 1
Arrears ...	3	3 0			
		252	„ Furniture and Fixtures ...	...	94 19 6
„ Rent, viz.:—			„ Salaries and Wages ...	275	5 4
Lecture Room and Library ...	239	4 6	„ Collector ...	10	15 2
Cellars ...	60	0 0	„ Auditors ...	2	2 0
		299			288 2 6
„ Visitors to Museum ...	94	14 9	„ Collections and Library ...	...	45 7 3
„ School Children ...	42	1 4	„ Postages ...	14	3 8
		136	„ Advertising and Printing ...	44	15 9
„ Sale of Guides ...	4	7 10	„ Lectures ...	136	0 11
„ Sundries ...	4	14 0	„ Telephone Co. ...	10	1 1
		9	„ Porter's Livery ...	6	0 0
„ Donation: Local Reception Committee ...	20	0 0	„ Sundries ...	11	12 10
„ Society of Mechanical Engineers ...	1	5 0	„ Commission Bank ...	1	4 0
„ Bank Interest ...	47	16 2			223 18 3
„ Midland Railway Dividend ...	200	0 0	„ Law Expenses ...	19	0 0
„ Sale of Midland Railway Stock ...	103	3 2	„ Compensation ...	10	10 0
„ Due to Treasurer ...			„ Drains ...	210	3 0
			„ Lecture Hall: Cleaning ...	57	16 4
			„ „ „ Fan ...	43	2 8
					340 12 0
		£1,085 13 11			£1,085 13 11

We have examined the Books and Vouchers of the Leeds Philosophical and Literary Society, and find the above to be a correct abstract of the same.

BEEVERS & ADGIE,
CHARTERED ACCOUNTANTS.

LEEDS, May 3rd, 1904.

Capital Account.

£2,013 1s. 2d. Preference 2½ per cent. Midland Railway Stock.

LIST OF DONATIONS AND ADDITIONS
TO THE
SOCIETY'S MUSEUM AND LIBRARY.

1903-1904.

Those marked thus † are Members or Subscribers of the Society.

ZOOLOGY.

- | | | |
|---|---|------------------------------------|
| A collection of Animals, in spirit,
from the Karoo District, Aberdeen,
Cape Colony, comprising: Locusts,
Spiders, Beetles, Snakes..... | } | Mr. Fred Atkinson. |
| Nests of Wrens | } | †Mr. W. Howgate. |
| Neptune's Cup..... | | |
| Skin of Vulture..... | | |
| Skull of Dog | | |
| Young of Water-Hen | } | Mrs. Eddison. |
| Wood or Field Mouse (<i>Mus sylvaticus</i>) | | |
| Gallinule | } | Mr. J. W. Marsden. |
| Brazilian Teal | | |
| Skulls of Horse and Porpoise..... | | Mr. E. R. Hepper, Heading-
ley. |
- A collection of about 1,700 Birds' Eggs
in a Glazed Cabinet, including
amongst British Birds:—Great Grey
Shrike, Spotted Flycatcher, Raven,
Hooded Crow, Arctic Tern, Sand-
wich Tern, Gannet, Plovers, Golden
Eagle, Peregrine Falcon, Merlin,
Kite, Bridled Guillemot, Brunnich's
Guillemot. Indian Birds:—Babbler,
Shrikes, Weaver Bird, Corby, Quail,
Yellow Wattled Plover, Iarus, Crane, †Mr. W. T. Crampton,
Bush Babbler, Bee-eater, Scavenger
Vulture, Spoonbill, Jacana.
American Birds:—Oriole, Bobolink,
Purple Grackle, Scarlet Tanager,
Bower Bird, Tailor Bird, Waxwing,
King-bird, Scissor Bird, Red-winged
Starlings, Roseate Tern, Tickeater,
Yellow-billed Cuckoo, Pelican, Cat-
Bird, Mocking Bird, Belted King-
fisher, Osprey, Chimney Swallow,
Heron, Stellar's Duck, &c.

A collection of about 60 Birds' Nests:—
 English: Red-backed Skrike, Stone-
 chat, Hawfinch, Nightingale, Marsh
 Tit, Jay, Ring Dove, Ring Ouzel,
 Cuckoo eggs in the nests of Pipits
 and Hedge Sparrow. American :
 Yellow-breasted Chat, Song Sparrow
 and Red Winged Starling. Nests
 of Varios, of the United States, with
 eggs of the parasitic Cow-bird.
 Casts of the eggs of the Epiornis, Moa,
 Apteryx, and Great Auk.
 A number of small glazed cases of
 Mammals and Birds.
 A large Case containing many speci-
 mens of animals from the Island of
 Mull, set up in suitable surroundings.

†Mr. W. T. Crampton,
 Roundhay.

GEOLOGY.

Antler of Elk, found when excavating
 at the Sewage Works, Knostrop,
 about 1891

Mr. A. Wade, Roundhay
 Road.

MINERALOGY.

Quartz, containing gold, from "The
 25-Mile," Coolgardie, W. Australia }

Capt. Fk. Shaw.

ETHNOLOGY.

Two Human Skulls †Mr. Wm. Howgate.

NUMISMATICS.

Jubilee Medal, Queen Victoria }
 Coronation Medals, Edward VII..... }

Purchased.

Medal, Pius IX., Pont. Max. An. XX. †Mr. Henry March.

First Brass Coin, Antoninus Mrs. Craig, Beeston Hill.

Maundy Money of Edward VII., 4d.,
 3d., 2d., 1d., 1903..... }

Purchased.

Seven Indian and East African Silver
 Coins, chiefly Peacock Rupees, or
 parts of that coin

Mr. G. H. Corringham,
 Chapeltown.

MODELS.

Models in Cork of—	
Vespasian's Amphitheatre, Rome...	} Major Tottie, Bell Busk.
Temple of Vesta, Tivoli	
Stonehenge	
Temple of Neptune, Paestum	
Arch of Sergii, Pola	
Fountains Abbey	
Parish Church, Hull	

The Models were made by Mr. Richard Tottie, Anlaby, near Hull, a great-uncle of the Donor, at various periods from 1814 to 1825.

CERAMICS.

Dutch Tiles.....	} Mr. Claude W. Atkinson, Beckenham.
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PHOTOGRAPHS AND MAPS.

Platinotype Prints (173) of many of the principal geological features of Britain	} Mr. Godfrey Bingley, Headingley.
Copy of Cossin's Map of Leeds.....	†Mr. E. K. Clark, F.S.A.
Prof. Kendall's Map of the Glacier Lakes of Yorkshire	} The Rev. W. L. Carter, M.A.

PUBLICATIONS.

Spink's Numismatic Circular, 1903...	†Mr. Henry March.
Journal of the Linnean Society, 1903	†Mr. Edward Atkinson, F.L.S.
Manual of Roman Coins, by Gnecci	} Mr. Claude W. Atkinson, Beckenham.
Descriptive List of Provincial Copper Coins or Tokens, issued between 1786 and 1796, by Samuel Birchall, Leeds	†Mr. J. R. Ford.
First Report on Economic Zoology...	} The Trustees of the British Museum.
Catalogue of the Madreporian Corals..	
Catalogue of Lepidoptera Phalaenæ...	
Handbook of Birds, Vol. IV.....	

PERIODICALS.

WEEKLY.

Nature Purchased.

MONTHLY.

Annals and Magazine of Natural
History.....} Purchased.

Geological Magazine Purchased.

Journal of the Chemical Society..... Purchased.

Monthly Notices of the Royal Astro-
nomical Society.....} The Society

Philosophical Magazine and Journal
of Science.....} Purchased.

BI-MONTHLY.

Journal of the Royal Microscopical
Society.....} The Society

QUARTERLY

Quarterly Journal of Microscopical
Science.....} Purchased.

Quarterly Journal of Geological Society The Society

Zeitschrift für Wissenschaftliche Zoo-
logie} Purchased.

ANNUALLY AND OCCASIONALLY.

Philosophical Transactions..... Purchased.

Proceedings of the Royal Society ... The Society.

Proceedings of the Royal Institution
of Great Britain} The Institution.

Publications of the Ray Society Purchased.

Fauna Gaskohle Purchased.

Abridgments of Specifications for Patents	The Comptroller - General of Patents.
British Association Report.....	The Association.
Greenwich Observations.....	The Astronomer-Royal.
Memoirs of the Royal Astronomical Society	The Society.
Radcliffe Astronomical and Meteorological Observations	Radcliffe Trustees.
British Rainfall.....	Purchased.
Monograph of the Palæontographical Society	Purchased.
Proceedings of the Yorkshire Geological and Polytechnic Society.....	The Society.
Transactions of the Leeds Naturalists' Club and Scientific Association.....	The Association.
Transactions of the Leeds Geological Association	The Association.
Transactions of the Leeds Astronomical Society	The Society.
Proceedings of the Liverpool Geological Society.....	The Society.
Journal of the Liverpool Geological Association	The Association.
Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne.....	The Tyneside Naturalists' Field Club.
Proceedings of the Birmingham Philosophical Society	The Society.
Annual Report of the Yorkshire Philosophical Society	The Society.
Journal of the Anthropological Society	Purchased.
Transactions of the Leicester Literary and Philosophical Society	The Society.
Report of the Committee of Leicester Town Museum	The Museum.
Report of the Royal Institution, Hull	The Institution.
Report of the Meteorological Department of the Borough of Southport.....	The Meteorological Observer.

Report of the Bristol Museum	The Museum Committee.
Report of the Reading Museum	{ The Free Library and Museum Committee.
Annual Report of the Brighton Town Museum	
Annual Report, Middlesex Hospital...	The Hospital.
Annual Report of the Birkenhead Literary and Scientific Society	{ The Society.
Proceedings of the Liverpool Literary and Philosophical Society	
Annual Report and Proceedings of the Liverpool Science Students' Association	{ The Association.
Memoirs and Proceedings of the Man- chester Literary and Philosophical Society	
Transactions of the Manchester Geo- logical Society	{ The Society.
Reports of the Manchester Museum Handbooks do. do.	
Annual Report of the Sheffield Literary and Philosophical Society	{ The Society.
Annual Report of the Chester Society of Natural Science and Literature	
Journal of the Royal Institution of Cornwall	{ The Institution.
Annual Report of the Royal Cornwall Polytechnic Society.....	
Report of Associated Architectural Societies	{ The Association.
Journal of the Chester Archæological and Historic Society	
Geological Record	Purchased.
Transactions of the Yorkshire Natural- ists' Union ..	{ The Union.
Proceedings of the Royal Society of Edinburgh	
Transactions do. do.	{ The Society.

Transactions of the Edinburgh Geological Society.....	} The Society.
Proceedings of the Glasgow Philosophical Society	} The Society.
Proceedings of the Berwickshire Naturalists' Club	} The Club.
Scientific Proceedings of the Royal Dublin Society.....	} The Society.
Scientific Transactions do.	
Transactions of the Royal Irish Academy	} The Academy.
Proceedings do. do.	
Journal of the Royal Geological Society of Ireland	} The Society.
Annual Report and Proceedings of the Belfast Naturalists' Field Club }	} The Club.
Publications of the Royal Swedish Academy of Sciences.....	} The Academy.
Papers of the Royal University of Norway	} The University.
Bulletin of the Geological Institution of the University of Upsala	} The Institution.
Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhandling.....	} Royal Danish Society of Sciences.
Bulletin, Société Impériale, Moscow... Leopoldina " Amtliches organ der Kaiserlichen, Leopoldino-Carolinischen Deutschen Akademie der Naturforscher	} The Society.
Mittheilungen der Kais. Königl. Geographischen Gesellschaft in Wien ...	} The Academy.
Memoirs of the National Academy of Sciences	
Report of Australasian Association for the Advancement of Science.....	} The Association.
Journal and Proceedings of the Royal Society of New South Wales	} The Society.
Journal of the Royal Geographical Society of Australasia	} The Society.

Wealth and Progress of New South Wales	The Agent-General.
Records of the Geological Survey of New South Wales	The Surveyor.
Memoirs of the Geological Survey of New South Wales	
Annual Report and Papers of the Department of Mines and Agriculture, New South Wales ..	The Department.
Prodromus of the Zoology of Victoria	The Editor.
Records of the Australian Museum	The Trustees.
Report of the Trustees of the Australian Museum.....	
Proceedings of the Royal Society of Queensland	The Society.
Queensland Agricultural Journal	The Society.
Annals of the Queensland Museum...	The Trustees.
Guide to Queensland	The Government.
Transactions and Proceedings of the New Zealand Institute	The Institute.
Papers and Proceedings of the Royal Society of Tasmania	The Society.
Proceedings and Transactions of the Royal Society of Canada	The Society.
Proceedings of the Canadian Institute	The Institute
Annual Report do.	
Transactions do.	
Proceedings and Transactions of the Nova Scotian Institute of Natural Science	The Institute.
Annual Report, Hamilton Public Library, Ontario, Canada	The Librarian.
Journal and Proceedings of the Hamilton Association	The Association.
Geological and Natural History Survey of Canada	Department of the Interior.
Annual Report and Papers—do.	
Contributions to Canadian Palaeontology	

Bulletin of the Natural History Society of New Brunswick.....	}	The Society.
Memorias de la Sociedad Científica (Mexico)	}	The Society.
" Boletín Mensual " Observatorio Meteorológico-Magnético Central de Mexico	}	The Editor.
Anuario del Observatorio Astrón- ómico Nacional Mexico.....	}	The Astronomer.
Boletín del Observatorio Astronómico Nacional de Tacubaya	}	The Observer.
Report of the Museum National, Rio-de-Janeiro.....	}	Directeur-Général.
Archivos do.	}	
Cape Meridian Observations	}	Cape Astronomer-Royal.
Report of H.M. Astronomer at the Cape of Good Hope to the Secretary of Admiralty		
Transactions of the American Philo- sophical Society		
Proceedings do.	}	The Society.
United States Geological Survey, Annual Report.....	}	The Department.
Contributions to American Ethnology.		
United States Geographical and Geo- logical Survey		
United States Department of Agricul- ture, Publications of	}	The Department.
Report of the Smithsonian Institution Smithsonian Miscellaneous Collections Smithsonian Contributions	}	The Institution.
Annual Reports of the Bureau of Ethnology		
Miscellaneous Publications of the Bureau of Ethnology		
Proceedings of United States National Museum		
Report do. do.	}	The Museum.
Bulletins do. do.		

Transactions of the Academy of Science of St. Louis	} The Academy.
Proceedings of the Academy of Natural Sciences of Philadelphia...	} The Academy.
Papers do. do.	
Transactions of the Wagner Institute of Science, Philadelphia.....	} The Institute.
Proceedings of the American Academy of Arts and Sciences.....	} The Academy.
Transactions of the Botanical Society of America	} The Society.
Botanical Society of America	Society, Cornell University.
Transactions of the Wisconsin Academy of Sciences, Arts, and Letters	} The Academy.
Bulletins of the Wisconsin Geological and Natural History Society.. ..	} The Society.
Memoirs of the National Academy of Sciences, Washington.....	} The Academy
Bulletins of the Philosophical Society of Washington.....	} The Society.
Proceedings of the Davenport Acad- emy of Natural Science.....	} The Academy.
Transactions of the Wagner Free Institute of Science, Philadelphia ...	} The Institute.
Annual Report, Transactions, and Mis- cellaneous Papers of the Historical and Scientific Society of Manitoba	} The Society.
Annual Report of the Trustees of the Cooper Union for the Advancement of Science	} The Union.
Proceedings of the Boston Society of Natural History, U.S.A.....	} The Society.
Memoirs do.	
Bulletins of the Essex Institute, U.S.A.	} The Institute.
Annual Report of the Curator of the Museum of Comparative Anatomy, Harvard College	} The College.
Annual Report of Harvard College	

Harvard University Catalogue	The University.
Annual Report of the Chicago Academy of Sciences.....	} The Academy.
Transactions of the Astronomical Observatory of Yale University ...	
Annual Report do.	} The University.
Report of the President of Yale University	
Catalogue do. do.	
Journal of the Elisha Mitchell Scientific Society	
Tufts College Studies.....	The College.
Transactions of the Meriden Scientific Association	} The Association.
Bulletins of the Buffalo Society of Natural Sciences..	
Bulletins of the University of Montana, Missoula	} The University.

LIST OF OFFICERS AND COUNCIL,

1904-1905.

OFFICERS.

PRESIDENT	J. E. EDDISON, M.D.
VICE-PRESIDENTS. .	<div> <div> <div>ARTHUR SMITHELLS, B.Sc., F.R.S.</div> <div>J. H. WICKSTEED, President Inst.M.E.</div> </div> </div>
HONORARY SECRETARIES .	<div> <div>E. K. CLARK, M.A., F.S.A., M.Inst.C.E.</div> <div>J. B. COHEN, Ph.D., B.Sc.</div> </div>
TREASURER	RICHARD WILSON.
HONORARY CURATOR IN GEOLOGY	<div> <div>R. H. KITSON, M.A.</div> </div>
HONORARY CURATORS IN ZOOLOGY	<div> <div>EDWARD ATKINSON, F.L.S.</div> <div>LOUIS C. MIALI, F.R.S.</div> </div>
HONORARY CURATOR IN ETHNOLOGY AND WORKS OF ART	<div> <div>J. E. EDDISON, M.D.</div> </div>
HONORARY LIBRARIAN .	AQUILA DODGSON.

The above officers, with the following gentlemen, form the

COUNCIL.

ALFRED BARRAN.	HUGH LUPTON.
JAMES E. BEDFORD, F.G.S.	THOMAS MARSHALL, M.A.
NATHAN BODINGTON, MA., Litt.D.	T. P. TEALE, M.A., F.R.S.
T. WALTER HARDING.	C. T. WHITMELL, M.A., B.Sc.
REV. CHAS. HARGROVE, M.A.	REV. J. R. WYNNE- EDWARDS, M.A.

Curator HENRY CROWTHER, F.R.M.S.

LIST OF MEMBERS AND SUBSCRIBERS,

1904-1905.

** Members deceased, whose shares have not been transferred.*

PROPRIETARY MEMBERS,

EXEMPT FROM ANNUAL SUBSCRIPTIONS.

3	Armitage, Robert	Farnley.
4	*Arthington, Robert	.
75	Bagshawe, Bernal	The Cedars, Headingley.
49	Baines, Mrs. Arthur	The Heath, Adel.
5	Baines, Mrs. H. S.	16, Mount Preston.
63	Barr, Frederick Horatio, J.P.	North Grange Road, Headingley.
6	Barran, John N.	Weetwood.
20	*Battye, John	.
22, 24	*Beckett, W., M.P. (2 shares)	.
18	Bilbrough, Alfred	15, Beech Grove Terrace.
8	*Binks, Benj., Junr.	.
45	Braithwaite, James, M.D.	Clarendon Road.
9	*Broadhead, Wm. Henry	.
11	*Brown, James	.
13, 14	*Calverley, Edmd. (2 shares)	.
15	*Charlesworth, C. H.	.
19	Close, James William	Greek Street.
26	Cousins, William James	Greek St. Chambers, Park Row.
39	Crawford, George Frederic	17, East Parade.
21	*Cudworth, John W.	.
23	Dibb, Mrs. Elizabeth	.
25	Eddison, John Edwin, M.D.	6, Park Square.
28	Empson, Christopher	Mill Mount, York.
29, 48	Ford, J. R., J.P. (2 shares).	61, Albion Street.
72	Gaunt, Leonard	Hazelbrae, Farsley.
36, 37, 38	Gott, Wm. Henry (3 shares)	.

- | | | |
|----|----------------------------------|---|
| 61 | Greenhow, Wm. T. | . Newton Cottage, Chapel-Allerton |
| 44 | Greenwood, Arthur | . Greenholme, Burley-in-Wharfedale. |
| 27 | Hall, William | . Hillside, Headingley. |
| 64 | Harding, Thomas Walter | . Tower Works, Globe Road. |
| 42 | Heaton, Beresford R. | . Round Down, Gomshall. |
| 50 | Hollis, Walter Dawson | . 26, Park Row. |
| 54 | Holgate, David | . 5, Bedford Street. |
| 47 | Ingham, John P. | . 14, East Parade. |
| 51 | Kinnear, Thos. John, M.A. | The Abbey, Malton. |
| 43 | Lancaster, William Thomas | Yorks. Banking Co. Ltd., Leeds. |
| 55 | *Luccock, Mrs. | . |
| 34 | Lumb, George Denison | . 31, Lyddon Terrace. |
| 57 | Lupton, Charles, M.A. | . The Harehills, Roundhay. |
| 32 | Lupton, Edward Basil | . Moorlands, Headingley. |
| 53 | Lupton, Fras. Martineau,
M.A. | . Rockland, Newton Park. |
| 56 | Lupton, Sydney, M.A. | . 102, Park Street, Grosvenor Sq.
London, W. |
| 58 | *Makins, Charles | . |
| 77 | Marsh, John Jenks | . Cressy House, Woodsley Road. |
| 59 | *Marshall, Arthur, F.G.S. | . |
| 60 | *Marshall, John, M.A. | . |
| 66 | Marshall, Reginald Dykes | Castlerigg Manor, Keswick. |
| 67 | Marshall, V. A. E., B.A. | . Monk Coniston, Ambleside. |
| 65 | Miall, Prof. Louis C., F.R.S. | 1, Richmond Mount, Headingley. |
| 7 | North, John | . North Hill, Roundhay. |
| 68 | Nunneley, J. A., M.B. | . Bath. |
| 17 | Padgett, Frederick A. | . 17, Park Place. |
| 46 | Raynar, Joseph Percival | . Moorfield Lodge, Headingley. |
| 70 | *Shepherd, John | . |
| 10 | Streatfeild, Richard James. | The Rocks, Uckfield, Sussex. |
| 71 | Tatham, Miss | . Springfield Mount. |
| 52 | *Taylor, Benjamin | . |
| 73 | Teale, Lionel H. | . Moorside, Far Headingley. |
| 74 | Tottie, Mrs. John William | Cold Coniston, Bell Busk. |

35	Truro, The Bishop of	Trenythron, Par Station, Cornwall
76	Ward, William	12, Bank Street.
2	Warde-Aldam, W. W.	Frickley Hall, Doncaster.
12	Wilson, Rev. Benjamin	Christ Church Vicarage, Mirfield
78	Wilson, Edmund, J.P.	Denison Hall.
33	Wilson, Henry B.	Westfield, Armley.
30, 31	Wilson, Richard	Westfield, Armley.
62	Wilson, Reginald A.	Westfield, Armley.
16	Wilson, Mrs. Robert L.	21, Lyddon Terrace.
40, 41, 69	Wood, William Hoffman	Park Square.
1	Wurtzburg, John Henry, J.P.	2, De Grey Road.

NEW PROPRIETARY MEMBERS,

WITH AN ANNUAL SUBSCRIPTION OF ONE GUINEA.

32	Atkinson, Edward, F.L.S.	Langholme, Franklin Road, Harrogate.
39	Bailey, John Wm.	St. Mark's Villas.
92	Barran, Alfred, J.P.	Moor House, Headingley.
119	Barrett, Albert	Holly Bush, Headingley.
17	Beaumont, James	St. John's Cottage, Leeds.
91	Bedford, James E., F.G.S.	Shireoak Road, Headingley.
15	Bilbrough, Wm. Radford	15, Beech Grove Terrace.
121	Blackburn, Henry G.	2, East Parade.
4	*Boothroyd, William	
89	Boston, Richard	Boar Lane.
10	Bowling, John	Newstead House, Spencer Place.
49	Braithwaite, William	Throstle Nest, Horsforth.
5, 6	Brown, G. W. (2 shares)	78, Belsize Park Gardens, Hampstead, London, N.W.
37	Bulmer, Miss	Blenheim Lodge.
1	Burrell, Benjamin A., F.I.C.	8, Springfield Mount.
77	Clark, Edwin Kitson, M.A., F.S.A., M.Inst.C.E.	Meanwoodside.

- | | | | |
|-------------------------------|---------------------------------------|---|--------------------------------------|
| 14 | Conyers, W. H. | . | Dunluce, Ben Rhydding. |
| 104 | Crawford, John William | . | Newton Lane. |
| 26 | Elliot, Douglas | . | 38, Park Row. |
| 19 | *Fairbairn, Sir Andrew | . | |
| 118 | Flitch, John R. | . | Moortown. |
| 3 | Ford, Gervase Lawson | . | Lower Bentham, R.S.O., Yorks. |
| 87 | Gibson, Rev. E. C. S., D.D. | . | Leeds Vicarage. |
| 108, 109,
110, 114,
115 | Gott, William Henry (P)
(5 shares) | } | |
| 84 | Grant, Prof. A. J., M.A. | . | 13, Cromer Terrace. |
| 7 | Hargrove, Rev. C., M.A. | . | 10, De Grey Terrace. |
| 16 | Harvey, William | . | The Grove, Roundhay. |
| 51 | Hoggard, Alfred | . | 25, Cavendish Road. |
| 98 | Howgate, William | . | 21, Blenheim Terrace. |
| 74 | Howgate, Wm. A. | . | 21, Blenheim Terrace. |
| 53 | Hudson, Robert | . | Weetwood Mount, Far Head-
ingley. |
| 120 | Ingham, Samuel | . | Headingley Hall. |
| 56 | James, Christopher William | . | Pen-y-Bryn, Chapel-Allerton. |
| 33 | Kendall, Prof. P. F., F.G.S. | . | Stainbeck Lane, Chapel-Allerton. |
| 46 | Kitson, Robert Hawthorn,
M.A. | . | Elmet Hall, Roundhay. |
| 47 | Kitson, Sir Jas., Bart., M.P. | . | Gledhow Hall. |
| 48 | Kitson, Mrs. F. W. | . | Burley Hill, Leeds. |
| 90 | Lawson, Frederick W. | . | Oaklands, Adel. |
| 21 | Lupton, Arnold, M.Inst.C.E. | . | 6, De Grey Road. |
| 95 | Lupton, Arthur Greenhow | . | Springwood, Roundhay. |
| 8 | Lupton, Henry | . | Lyndhurst, Headingley. |
| 99 | Lupton, Hugh | . | The Acacias, Roundhay. |
| 55 | Lupton, Mrs. John | . | Moorlands, Headingley. |
| 63,) | Lupton, Fras. Martineau, | | |
| 100 f | M.A. (P) (2 shares) | . | Rockland, Newton Park. |
| 94 | Malcolm, John Cooper | . | Brighton Villa, New Leeds. |
| 25 | Marsden, Mrs. H. R. | . | Avenue House, Woodhouse Lane |
| 60 | Marshall, Thomas, M.A. | . | Highfield, Chapel-Allerton. |

27	Maude, William Henry	Middleton Lodge, Leeds.
44	Merry, Mark Fenton	14, St. John's Square, Wakefield.
117	Middleton, Arthur	Calverley Chambers, Victoria Sq.
72	Middleton, Robert	Sheepscar Foundry, Leeds.
30	Nicholson, Marshall	Middleton Hall, near Leeds.
68	Oxley, James Walker	Spenfield, Weetwood.
82	Pearson, John Thomas	The Hall, Melmerby, S.O.
11	Pegler, Thos. Boyne	3, Sholebroke Avenue, Leeds.
93	Phillips, J. S. R.	55, Albion Street.
69	Reynolds, Miss	17, Ashwood Villas, Headingley.
18	Robson, A.W. M., F.R.C.S.	8, Park Crescent, Portland Place, London, W.
105	Ryder, Miss	Gledhow Hill.
112	Sagar-Musgrave, J. M.	Red Hall, Shadwell.
54	Schüddekopf, Prof. A. W.	32, Springfield Mount.
80	Smith, Arthur I. E.	Albion Street.
13	Stockdale, Miss Enid	Spring Lea, Springfield Mount.
57	Stringer, John William	Inglebank, Far Headingley.
73	Teale, T. P., M.A., F.R.S.	North Grange, Headingley.
58	Thompson, Chas. F.	Beech Grove House.
71	Ward, John, J.P.	Moor-Allerton House.
41	Webb, Joseph S.	26, Park Row.
42	*Whiting, John	
83	Wicksteed, J. H., President Inst.M.E.	Weetwood Croft, Far Headingley.
31	Wilkinson, William M.	220, Newton Hill.
24	Wynne-Edwards, Rev. J. R., M.A.	The Grammar School, Leeds.
113	Young, R. L., L.D.S. Eng.	3a, Hillary Place.

ORDINARY MEMBERS.

WITH AN ANNUAL SUBSCRIPTION OF TWO GUINEAS.

11	Ramskill, Josiah	29, Meadow Lane.
13	Stratten, Rev. Canon	Park Square.

NEW ORDINARY MEMBERS,

WITH AN ANNUAL SUBSCRIPTION OF ONE GUINEA.

- | | | |
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| 34 | Allerton, The Rt. Hon. | |
| | Lord | Allerton Hall, Leeds. |
| 48 | Barran, Rowland H., M.P. | Beechwood, Roundhay. |
| 4 | Barwick, J. M. | Low Hall, Yeadon. |
| 5 | Bedford, James E., F.G.S. | Arncliffe, Shireoak Road. |
| 40 | Bodington, Prof. N., Litt.D. | Shireoak Road, Headingley. |
| 10 | Bousfield, Charles Edward | Kingsbridge, Devon. |
| 7 | Branson, F. W., F.I.C. | Wynneholme, Far Headingley. |
| 15 | Bray, George | Wood Lane, Headingley. |
| 72 | Brigg, Matthew A. | 12, Sholebroke Avenue. |
| 11 | Briggs, Riley | Osgodby Hall, Selby. |
| 75 | Brunton, George | Blenheim Terrace Woodhouse Lane. |
| 74 | Cohen, Prof. J. B., Ph.D.,
B.Sc. | 13, Cardigan Road, Headingley. |
| 33 | Denison, Samuel | 4, St. George's Terrace, Far Headingley. |
| 18 | Dodgson, Aquila | Southleigh, Headingley. |
| 65 | Eddison, Octavius, B.A. | St. Helen's, Adel. |
| 20 | Eddison, Mrs. R. W. | 4, Beech Grove Terrace. |
| 22 | Fairley, Thomas, F.R.S.E. | 8, Newton Grove. |
| 24 | Gascoigne, F. C. Trench | Parlington Park, nr. Garforth. |
| 25 | Goodman, Prof. John | The Yorkshire College. |
| 35 | Grahl, Conrad E. | 13, St. Helen's Place, London, E.C. |
| 42 | Hannam, S. J. W. | 33, Cromer Terrace. |
| 60 | Harland, J. W. | Headingley. |
| 78 | Hawkesworth, Edwin | Sunnyside, Crossgates. |
| 28 | Hepper, John, J.P. | Clareville, Headingley. |
| 30 | Hobson, Alfred | Summercourt, Roundhay. |
| 31 | Illingworth, William | Bramhope Manor, near Leeds. |
| 6 | Jackson, Richard | 11, Spring Road, Headingley. |
| 23 | Lupton, Arnold, M.Inst.C.E. | 6, De Grey Road. |

- | | | |
|----|---------------------------------------|---|
| 45 | March, George | . Oaklands, Scarcroft. |
| 61 | Mason, Charles Letch | . . |
| 52 | Mecredy, Mrs. A. S. | . Suffolk House, Cumberland Road, Headingley. |
| 37 | Meredith, Mrs. | . The Cottage, Stanningley Road, Bramley. |
| 46 | Middleton, Gilbert | . Calverley Chambers, Victoria Sq. |
| 58 | Nicol, W. H. | . 12A, Clarendon Road. |
| 53 | Nussey, Ernest | . Victoria Road, Headingley. |
| 54 | Nussey, Thomas | . Bramley Grange, Thorner. |
| 55 | Nussey, Mrs. S. L. | . Potternewton Hall. |
| 56 | *Nussey, Mrs. Peter | . . |
| 43 | Powolny, E. Adolph | . Harrogate. |
| 59 | Ramsbotham, S. H., M.D. | . Fair Stead, Ripon Rd., Harrogate. |
| 26 | Ramsden, Arthur | . 20, Cemetery Place, Woodhouse Lane. |
| 17 | Redmayne, John | . Grove House, Grosvenor Road. |
| 73 | Rowley, Walter, C.E. | . Alder Hill, Meanwood. |
| 44 | Rumboll, Mrs. | . Cavendish Road. |
| 76 | Smithells, Prof. A., B.Sc.,
F.R.S. | . Wood Royd, Ben Rhydding. |
| 1 | Stroud, Prof. W., D.Sc., M.A. | . Rupert Lodge, Grove Road. |
| 64 | Tweedale, John | . The Moorlands, Dewsbury. |
| 57 | Ward, George, F.C.S. | . Buckingham Ter., Headingley. |
| 3 | Webb, William Henry | . Aire Street. |
| 80 | White, Ernest A. | . Blundell Street. |
| 47 | Whitmell, C. T., M.A., B.Sc. | . Invermay, Headingley. |
| 85 | Willson, M. A. H. | . 96, Clarendon Road. |

ANNUAL SUBSCRIBERS OF ONE GUINEA.

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| Bakewell, William | . 38, Park Square. |
| Barran, Mrs. | . Weetwood. |
| Bartholomew, W. H., C.E. | . Ridge Way House. |

Bedford, Charles S.	. Broomleigh, Chapel Lane.
Birch, Prof. De Burgh, M.D.	. 16, De Grey Terrace.
Booth, William	. Longfield, Rodley.
Boyce, Frank	. 7, Whitehorse Street.
Braithwaite, Richard Hale	. Kirkstall Lane, Headingley.
Butler, Edmund	. Kirkstall Forge.
Cameron, J. Spottiswoode, M.D., B.Sc.	. Ridge Mount, Cliff Road.
Chorley, R.	. Cookridge Street.
Clark, Miss	. Potternewton.
Connal, Prof. B. M., M.A.	. 13, Beech Grove Terrace
Crampton, W. T.	. Parcmont, Roundhay.
Croft, E. O., M.D.	. 24, Hyde Terrace.
Crook, Miss	. Leeds Church Middle Class Girls School.
Cross, J. R.	. Newlaithes Hall, Horsforth.
Croysdale, John	. Westfield, Chapel-Allerton.
Dodgshun, C. C.	. Hyde Terrace.
Draper, Rev. W. H., M.A.	. The Rectory, Adel.
Duncan, Robert	. 138, Chapeltown Road.
Dykes, Rev. E. H., M.A.	. 38, Hyde Terrace.
Flockton, William	. Hopewell House, Oulton.
Foster, George	. Castlestead, Boston Spa.
Gardner, Wilson	. 10, Norwood Terrace, Victoria Road, Headingley.
Garforth, Mrs.	. Snyderdale Hall, near Pontefract.
Gill, L. W.	. Isles Lane Council School.
Gillespie, C. M., M.A.	. The Yorkshire College.
Green, John H.	. Horbury, near Wakefield.
Green, William	. 1, Tanfield Place.
Griffith, Prof. T. Wardrop, M.D.	. 43, Park Square.
Haigh, F.	. 30, Lyddon Terrace.
Hamilton, Geo. C.	. Halstead, Headingley.
Hannam, William Simpson	. 4, East Parade.
Hardcastle, Melville	. Bank of England.
Harper, Alfred	. Eccleshill, near Bradford.
Hartley, Prof. R. N., M.B.	. 2, Clarendon Road.

Hastings, G.	. 15, Oak Lane, Bradford.
Hellier, J. B., M.D.	. Glengariff, North Grange Road, Headingley.
Hodges, I.	. Whitwood, Normanton.
James, Chas. Hy.	. 1, Park Square.
Keenan, Mrs.	. 2, Woodlands, Weetwood Lane.
Kirk, Albert E.	. 13, Bond Street.
Kitson, F. J.	. 1, Gledhow Grange, Chapeltown.
Kitson, Sydney D., M.A.	. Greek Street Chambers.
Knight, Albany R.	. County Buildings, Park Street.
Lawson, Sir Arthur T., Bart.	. Weetwood Grange, Far Headingley.
Legge, Rev. J.	. Cardigan Road.
Littlewood, H., F.R.C.S	. Park Square.
Mackey, W. M., F.C.S.	. Victoria Chambers, South Parade.
Manley, Miss Kate	. Claremont, St. John's Grove.
March, Henry	. 2, West Hill Terrace, Chapel-Allerton.
Megson, Albert	. Spencer Place, New Leeds.
Moorman, F. W., B.A., Ph.D.	. 2, Hollin Lane, Far Headingley.
Mozley, J. R., M.A.	. 1 Holly Bank, Far Headingley.
Murphy, Albert J.	. 2, Springfield Place.
Newill, Frank	. 9, Kelso Road.
Newstead, J. S.	. Woodville, Horsforth.
Nicholson, John Carr	. Moorfield House Headingley.
Nixon, S. E.	. St. Chad's Hill, Far Headingley
Peate, Jonathan	. Guiseley.
Pepper, J. E.	. 42, Hyde Terrace.
Phillips, John Henry	. Hazel House, Methley.
Phillips, Rev. J. F.	. Emmanuel Vicarage.
Reisz, E.	. University of Leeds.
Richardson, W. W.	. 1, Montpelier Terrace.
Robinson, Edmund	. 42, Park Square.
Rogers, Prof. L. J., M.A., Mus.Bac.	. 13, Beech Grove Terrace.
Sanders, T. W.	. 5, Blenheim Square.
Saville, Miss S. E.	. 12, Granby Road, Headingley.

Scatcherd, Mrs. Alice Cliff	. Morley, near Leeds.
Sharp, Gordon, M.D.	. 3, St. George's Terrace.
Smith, Thomas, M.D.	. Leathley Lodge, Hunslet Road.
Sykes, Arthur	. Roundhay Grange.
Talbot, Grosvenor, J.P.	. Southfield, Burley, Leeds.
Tannett-Walker, Arthur T.	. The Elms, Weetwood.
Tapp, C.	. 12, Hopefield Ter., Headingley.
Taylor, Mrs.	. Buckingham House, Headingley.
Teale, Michael A., M.A.	. Cookridge Street.
Tetley, C. F., M.A.	. Spring Bank, Headingley.
Thompson, Vincent T., M.A.	. 195, Belle Vue Road.
Waddington, George	. 36, Great Wilson Street.
Ward, Edward, M.A., M.B.	. 30, Park Square.
West, Lionel F., M.R.C.S.	. Morley.
Wilkinson, J. J.	. Burnside, Skipton.
Wilkinson, William	. Ashton House, Hemingborough, E. Yorks.
Williamson, H. L., M.I.C.E.	. 4, St. Chad's Gardens, Far Headingley.
Wilson, D'Arcy B.	. Seacroft.
Wilson, J. R. R.	. West Hill, Chapeltown Road.
Wood, Thomas	. St. Mark's Ter., Woodhouse Lane.

ANNUAL SUBSCRIBERS OF SEVEN SHILLINGS AND SIXPENCE.

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Armistead, Mrs.	. 8, Avenue Hill, Harehills Avenue.
Barran, Miss Lorna	. Weetwood.
Barran, Miss Edith	. Do.
Barran, Miss Nathalie	. Do.
Birch, Mrs.	. 16, De Grey Terrace.
Branson, Mrs. F. W.	. Wynneholme, Far Headingley.
Broadhead, Miss	. Craiglea, Headingley.
Butler, Mrs. Edmund	. Kirkstall Forge.
Butler, Miss	. Do.
Butler, B. H.	. Do.

Cameron, Mrs.	. Ridge Mount, Cliff Road.
Cohen, Mrs. J. B.	. 13, Cardigan Road.
Crampton, Charles	. Parcmont, Roundhay.
Cross, Mrs. J. R.	. Newlaithes Hall, Horsforth.
Croysdale, Mrs. J.	. Westfield, Chapel-Allerton.
Croysdale, Miss	. Do. do.
Croysdale, John H.	. Do. do.
Dodgshun, Mrs. C. C.	. Hyde Terrace.
Dodgson, Mrs. A.	. Southleigh, Headingley.
Dykes, Mrs.	. 38, Hyde Terrace.
Foster, Mrs. George	. Castlestead, Boston Spa.
Gardner, Mrs. Wilson	. 10, Norwood Ter., Headingley.
Garforth, Miss	. Snydale Hall, near Pontefract.
Grant, Mrs.	. 13, Cromer Terrace.
Green, Miss	. 1, Tanfield Place.
Griffith, Mrs. T. Wardrop	. 43, Park Square.
Haigh, Miss	. 30, Lyddon Terrace.
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Hannam, Mrs. W. S.	. 4, East Parade.
Hellier, Mrs.	. Glengariff, North Grange Road.
Hodges, Mrs. I.	. Whitwood, Normanton.
Ingleby, Mrs.	. 12, Bainbrigge Road.
James, Mrs.	. 1, Park Square.
Keenan, Miss	. 2, Woodlands, Weetwood Lane.
Kitson, Mrs. F. J.	. 1, Gledhow Grange, Chapeltown.
Moorman, Mrs.	. 2, Hollin Lane, Far Headingley.
Murphy, H. N., B.Sc.	. 2, Springfield Place.
Nelson, Miss C. E.	. 34, Hyde Terrace.
Nelson, Miss Louisa	. Do.
Newill, Miss	. 9, Kelso Road.
Nicholson, Mrs.	. Moorfield House, Headingley.
Nicholson, Miss	. Do. do.
Nicholson, Wilfred E.	. Do. do.
Nixon, Mrs.	. St. Chad's Hill, Far Headingley.

Nussey, Miss	. Potternewton Hall.
Oldfield, Miss	. 30, Lyddon Terrace.
Pepper, Mrs. J. E.	. 42, Hyde Terrace.
Phillips, Miss Dorothy	. Hazel House, Methley.
Ramsden, Mrs. B.	. Cemetery Place, Woodhouse Lane
Redmayne, Mrs. John	. Grove House, Headingley.
Richardson, Mrs.	. 1, Montpelier Terrace.
Ryder, Miss Louisa	. Gledhow Hill.
Seymour, Miss E.	. Morley.
Stroud, Mrs. W.	. Rupert Lodge, Grove Road.
Talbot, Mrs. G.	. Southfield, Burley.
Tannett-Walker, Mrs. A. T.	. The Elms, Weetwood.
Tapp, Mrs. C.	. 12, Hopefield Terrace.
Taylor, Miss	. Buckingham House, Headingley.
Taylor, T. L.	. Do. do.
Teale, Miss	. North Grange, Headingley.
Tetley, Mrs. C. F.	. Spring Bank, Headingley.
Ward, Mrs. G.	. Buckingham Terrace.
Williamson, Mrs. H. L.	. 4, St. Chad's Gardens, Far Headingley.
Wilson, Mrs.	. West Hill, Chapeltown Road.
Wood, Miss	. St. Mark's Ter., Woodhouse Lane

Members and Subscribers are requested to inform the Curator of any errors that may be found in the above list.

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Professor T. Clifford Allbutt,
M.D., F.R.S., Cambridge.

[Elected 1889].

The Right Hon. Lord Avebury,
D.C.L., LL.D., F.R.S., High
Elms, Hayes, Kent.

[Elected 1883].

The Right Rev. Bishop Barry,
D.D., Canon of Windsor,
Windsor.

[Elected 1863].

Prof. Graham Bell, The National
Telephone Company, Milk
St., Boston, Mass., U.S.A.

[Elected 1883].

Dr. Day, Mendoza, Argentine
Republic.

[Elected 1870].

Herr Franz Foetterle, Secretary
of the Imperial Royal Geo-
graphical Society of Vienna.

[Elected 1861].

Francis Galton, F.R.S., 42, Rut-
land Gate, Knightsbridge,
London, S.W.

[Elected 1869].

The Hon. W. A. B. Gellibrand,
Cleveland, Ouse, Tasmania.

[Elected 1871].

Cyril Graham, B.A., 9, Cleveland
Row, St. James's, London, S.W.

[Elected 1863].

Wm. Hancock, F.L.S., F.R.G.S.,
c/o Commissioner of Customs,
Kowloon, Hong Kong, China.

[Elected 1892].

Wm. Hartley, Durban, Port
Natal.

[Elected 1863].

Capt. James Holt, A.D.C.,
Government House, Welling-
ton, New Zealand.

[Elected 1862].

Sir Clements R. Markham,
K.C.B., F.R.S., F.L.S., Pres.
R.G.S., 21, Eccleston Square,
Pimlico, London, S.W.

[Elected 1877].

H. G. Moore, Glenmark, New
Zealand.

[Elected 1871].

Sir Charles Nicholson, Bart.,
D.C.L., &c., The Grange,
Totteridge, Hertfordshire.

[Elected 1862].

C. C. Oxley, Minster House,
Ripon.

[Elected 1857].

Sir T. Wemyss Reid, LL.D., 26,
Bramham Gardens, South
Kensington, London.

[Elected 1887].

The Most Hon. the Marquis of
Ripon, K.G., F.R.S., F.G.S.,
Studley Royal, Ripon.

[Elected 1861].

Sir A. W. Rücker, D.Sc.,
LL.D., F.R.S., 19, Gledhow
Gardens, London.

[Elected 1889].

Prof. T. E. Thorpe, C.B., D.Sc.,
Ph.D., F.R.S., Somerset House,
London.

[Elected 1887].

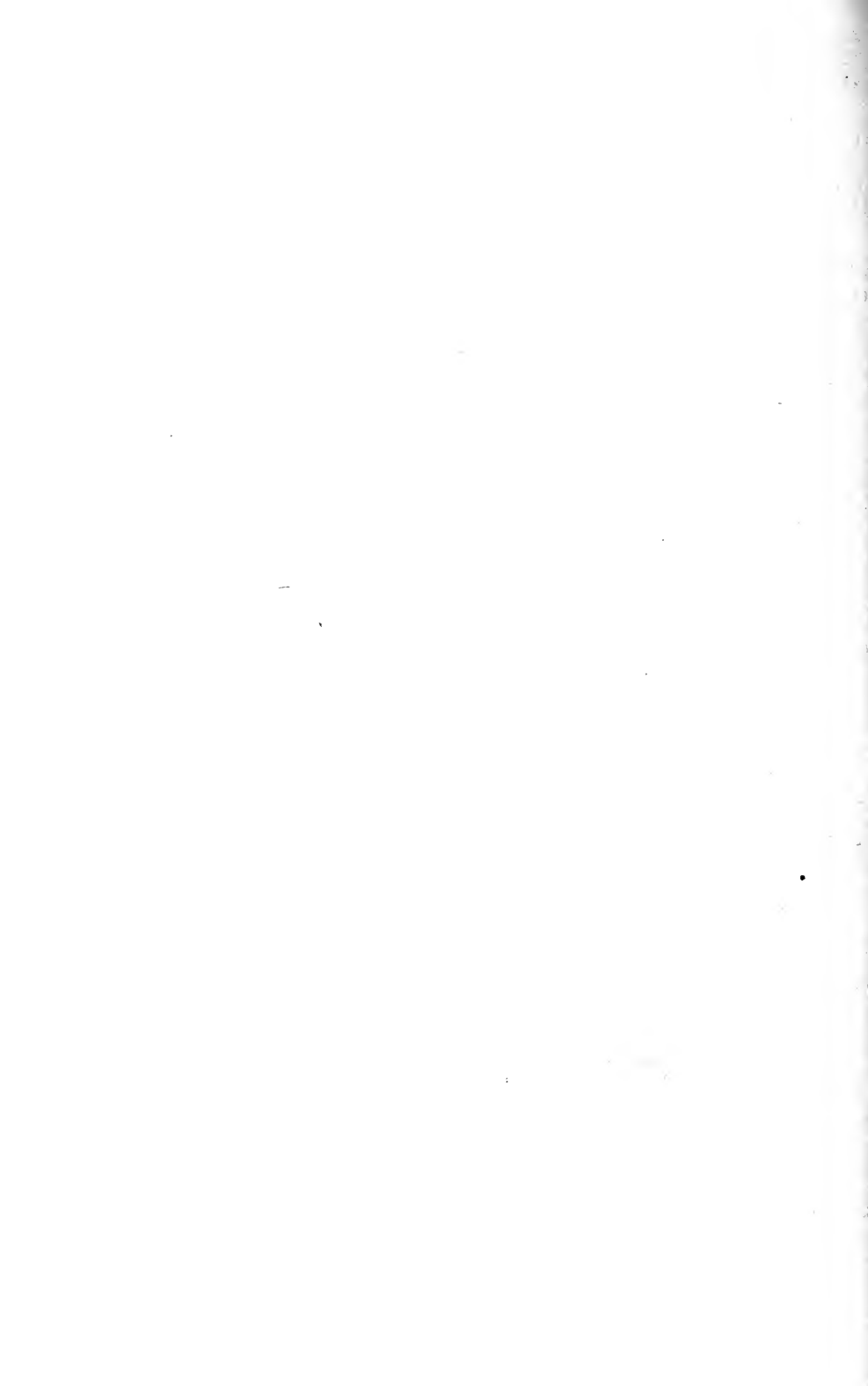
Edward Harry Woods, Rosario,
Argentine Republic.

[Elected 1870].

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